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USSR Report

MILITARY AFFAIRS

No. 1804

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AIR FORCES

ALCOHOL INTENDED FOR SERVICING AIRCRAFT EXCHANGED FOR BUILDING MATERIALS

Moscow KRASNAYA ZVEZDA in Russian 4 Sep 83 p 2

[Article, published under the heading "Following Up on a Letter," by KZ correspondent Lt Col G. Ivanov: "'Leak'"]

[Text] The roar of jet engines rapidly died down in the hot air, and it seemed that the missile-armed aircraft were gliding silently through the heated sky above the desert. I was talking with aviation regiment commander Lt Col V. Zakhar'in about a flight he had just completed.

"One of the young pilots started transmitting at the same time I was," the officer related. "It was necessary to switch to an alternate frequency."

"What if the radio had failed?" I inquired. "I would have switched on the backup."

"Is it always ready to go?"

"Quite honestly, not always entirely ready," the lieutenant colonel slowly replied. "Sometimes it has not been serviced with coolant."

The coolant is alcohol. And it was not mere happenstance that I began discussing this subject with the regimental commander. I was brought to the airfield by a letter written by Engr-Maj N. Fadeyev, informing the editors that alcohol was frequently being improperly used in that regiment. And while Lieutenant Colonel Zakharin was in the air, Sr Lt Tech Serv A. Len'ko, radar equipment group chief, and mechanic Pvt E. Akhundov, in the presence of deputy squadron commander for aviation engineering service Maj Tech Serv A. Mikhaylov, opened at my request the radio cooling system drain cock on one of the aircraft. Not a single drop of alcohol appeared.

Where was this "leaking" taking place?

Here is what happens. Precise execution of the requirements of documents regulating accident-free flight operations and observance of technological discipline and readying of aircraft depend on the conscienciousness and feeling of personal responsibility on the part of each individual airman. Officer Len'ko, for example, had repeatedly demanded precise observance of the process of readying aircraft. There were times, however, when the group chief would

receive no alcohol for filling the equipment cooling system. Nevertheless at the end of each month Maj Tech Serv A. Mikhaylov would bring for his signature a document certifying expenditure of "coolant."

"I don't know how much alcohol was received and where it was consumed," the group chief would retort in such instances. "I won't sign!"

The deputy regimental commander for aviation engineering service, Engr-Lt Col A. Goncharenko, would then remonstrate with the obstinate officer: "Don't get excited. You'll be serving here for quite some time. What's more, you are wrong in supposing that somebody is putting alcohol to personal use. You can see how we are working tirelessly to improve our training facilities. But nobody gives us building materials free of charge...."

Len'ko usually would ultimately yield to this last argument. But on one occasion he snapped in no uncertain terms: "Until the radio is serviced with alcohol as prescribed, I shall not allow the aircraft to take to the air!"

The regimental commander summoned the officer and, after hearing his arguments, stated: "Release the aircraft!"

During exercises a situation frequently arises where a commander makes a bold decision. Of course it is always aimed at successful accomplishment of the assigned mission, and of course it is always in conformity with the provisions of guideline documents. But nobody is authorized to assume responsibility for actions contrary to flight regulations. And the position taken by the regimental commander in this instance was puzzling at the very least.

Nevertheless this incident caused some to ponder the question: officer Len'ko was then issued several kilograms of alcohol for aircraft servicing.

Engr-Sr Lt G. Kudin needed alcohol for the cockpit glass, but sometimes he would not be supplied any. But water cannot be used on the glass: it damages the surface layer. The regimental commander himself, Lt Col V. Zakhar'in, on checking out an aircraft before taking it up, would complain about the cloudy glass, but would calm down upon hearing the explanation that they were out of alcohol: nothing could be done about it.

"Leakage" of alcohol earmarked for servicing aircraft was also taking place in the regiment's technical maintenance unit. Group chief Engr-Sr Lt A. Kozak, for example, was being issued one third the prescribed amount for performing equipment servicing operations.

Once Engineer-Senior Lieutenant Kozak, making reference to the prescribing documents, demanded that technical maintenance unit chief Engr-Maj I. Sosarev issue him the prescribed quantity of alcohol. At first his superior stubbornly resisted, but ultimately yielded to the persistence of his subordinate. Since that time on each occasion Kozak had to entreat the technical maintenance unit chief at length to issue the prescribed quantity, but he was not always successful.

"As a rule I would issue half the prescribed amount," Sosarev said in conversation with me.

The persistence of some aviation personnel, who have sought to ensure observance of the required aircraft servicing procedures, strange as it may seem, turned against them. Some ranking officers, for example, began saying that Len'ko had been prematurely promoted to the position of group chief, that this specialist had not yet "sufficiently matured." And Kozak was confidentially told that the technical maintenance unit chief intended to write in his fitness report that he placed the interests of his group above those of the technical maintenance unit as a whole. Of course all this was discussed by aviation personnel on the flight line and in the smoking areas.

It is not surprising that some people, knowing about these conversations, preferred not to make life more difficult for themselves. Aircraft equipment engineer Engr-Capt A. Mamulin, for example, after receiving from officer Goncharenko several refusals to issue alcohol, merely began making the following entries in the log books: storage batteries not serviced with alcohol. By signing this entry, Mamulin was taking responsibility off himself, as it were; he preferred not to air dirty linen.

A unique situation had formed in the collective, fostering a displacement of ethical criteria: unhealthy public opinion gradually was being formed around actions aimed at ensuring that regulations were followed. And all this began with a campaign against "leakage" of alcohol.

The author of the letter feels that the main culprit responsible for this "leakage" is Engr-Lt Col A. Goncharenko, who left several months back to report to a new assignment. The facts confirm that this is indeed the case. Serving as deputy regimental commander for aviation engineering service, Engineer-Lieutenant Colonel Goncharenko had arranged things in the unit so that every deputy squadron commander for aviation engineering service had to let him have at least one fourth of the alcohol received for the aircraft. He would simply come to the squadron and take "his alcohol." Sometimes Goncharenko simplified the collection process.

"I once went to supply to get alcohol for our squadron," related deputy subunit commander for aviation engineering service Maj Tech Serv A. Bolibok, "and was told that Goncharenko had already taken it."

The "leaking" of alcohol was taking place before the very eyes of all aviation personnel, and therefore the following question naturally arises: "What was the attitude of the party organization and volunteer inspectors toward this process?"

"I knew nothing and heard nothing," stated Sr Lt V. Nikitin, chairman of the volunteer inspection group, shrugging his shoulders.

There is no need to comment on this. But judging from the fact that the matter of violation of aircraft servicing procedures was not ever brought up for discussion at a meeting of the party committee, the party committee also "did not know" about the "leakage." And yet the deputy regimental commander for political affairs, Maj N. Afanas'yev, knew about everything. He is of the

opinion, however, that the alcohol which failed to reach the aircraft was being used with benefit to the unit, since various building materials were "acquired" with its help.

What about the building materials? I saw a bath facility constructed in a semi-basement adjacent to the gymnasium, together with a recreation room and swimming pool.

"At one time the pilots were permitted to use this bath facility," stated its "chief custodian," the regiment's chief of physical training and sports, Sr Lt G. Krasnitskiy. "But after they started playing ball in the pool, I placed it off limits to them."

Goncharenko, however, enjoyed proprietorship rights to the bath facility. Incidentally, the chief of the technical maintenance unit decided to provide himself with complete independence in this domain and proceeded to build his own little bathhouse. I also inspected the technical maintenance unit laboratories. In contrast to his bathhouse, they present a rather modest appearance and bear no traces of concern for these facilities.

Officer A. Goncharenko was replaced as deputy regimental commander for aviation engineering service by Engr-Maj A. Kruzin. But violations of equipment servicing procedures continued, and here is why. When you thoroughly examine the situation established in the unit, you begin to realize that the "leakage" of "coolant" is a consequence, as it were, of leakage of party firmness, of demandingness on the part of certain officers, of their sense of responsibility for their assigned task. And that, as they say, is precisely the way things are.

3024
CSO: 1801/474

OFFICERS COMPLAIN SHIPBOARD STUDY INADEQUATE FOR PASSING EXAMINATIONS

Moscow KRASNAYA ZVEZDA in Russian 4 Sep 83 p 2

[Article, published under the heading "The Navy on Long Cruises," by Engr-Capt 2nd Rank N. Karnaukh: "Ocean Maximum"]

[Text] Proficiency rating tests were in progress in the unit. Specialists from various crews faced a strict rating commission. When it came the turn of the mechanics on the team led by WO I. Platonov, one of the officers commented: "These men are out of luck."

"Why?"

"They have just returned from an extended cruise. And as you know, they do not have time to prepare for tests on extended cruises...."

Platonov's men, however, proved him wrong. Their answers displayed depth of knowledge of theory and were nicely reinforced with practical skills. Participation in an extended cruise, as should have been the case, did not hinder them from preparing for proficiency-rating tests but, on the contrary, helped them. Sr Sn N. Bykov, for example, having completed his answer to a question on the features of operation and maintenance of a refrigeration unit in conditions of elevated temperatures and receiving a high mark, could not restrain a happy smile: "At sea we encountered all this in a practical way time and again. You remember well that which the ocean taught you."

But why do some officers still have the opinion that at sea conditions for conducting specialized training and preparing for proficiency rating tests are worse than in port? In my opinion this occurs by virtue of a certain inertia, adherence to obsolete views on methodology.

Such forms of specialized training as training group classes and classroom drills using various simulators, working displays, and "sectioned" models of combat equipment have long been in use in the navy. They continue today to be extensively utilized at naval bases. But when a ship is at sea, conditions for employing these methods are more difficult. The fact that crewmen are busy standing watch as well as the dynamic nature of life at sea most frequently make it impossible to assemble a full training group, and sometimes even part of a training group. It is also more difficult to utilize visual aids.

Because of these difficulties it was believed at one time that it was advisable for personnel to conduct the program of specialized training and preparation for proficiency rating testing for the most part in base, when the ship is tied up, while performing practical duties when at sea. Today, now that our navy has become a blue-water fleet, when ships frequently spend many months on end at sea, away from their base, organization of full-value, systematic specialized training of personnel at sea has demanded special attention.

It is true that holding occupational specialty training classes and drills at sea involves certain difficulties. But what is the conclusion? There is only one -- particularly vigorous innovativeness, inventiveness, and methodological quest are demanded of those who supervise training.

Meriting attention in this connection is the experience amassed on the ship on which Engr-Sr Lt A. Lushinskiy until recently served as engineer officer. On the extended cruise from which the ship returned not too long ago they developed a rather smoothly functioning system of specialized training. The ship's officers were concerned primarily with the training effect of watch duty. They reasoned as follows: watches take people away from training classes and drills, but watch duty can also become an excellent school of developing excellence. The commanding officer, the executive officer, and the subunit commanders, when touring the duty stations and checking watchstander performance, began following the practice of questioning the men on various topics. They began more frequently presenting unusual hypothetical scenarios and devoting more attention to post-watch critiques.

The decision was made to conduct routine training activities on an entire watch basis. Individual training assignments were aggressively utilized. Personnel worked independently on a number of items, at individually convenient times, and later they would report to their group leaders at a designated time.

Incidentally, they also concerned themselves with making the job of leader personnel easier. A special watch replacement schedule was prepared. When necessary officers and warrant officers conducting training classes would be replaced by the best prepared team leaders and section commanders.

All these and other measures produced good results. The men's specialized-area proficiency improved while at sea. Many crew members also boosted their proficiency ratings. And the increase in the number of proficiency-rated specialists is greater than in the past, when personnel prepared on board ship to be tested back in base. Therefore the comparison, as they say, favors the ocean.

In my opinion discussion about where it is better to prepare proficiency-rated specialists -- in base or at sea -- is groundless. There are plus points to be found everywhere. One must have the ability to utilize them. If a ship is in base and the men have the opportunity to make intensive use of training classrooms, it would be wrong not to do so. Is it right then to let slip the excellent opportunity provided by time at sea to increase one's knowledge and improve one's skills directly on operating equipment and when performing practical tasks?

It is precisely a focus on the practical aspect of specialized training which shows the way to achieve effective training at sea. Unfortunately not everywhere do they yet understand this. The following sometimes occurs. A ship is on an extended cruise. The ship's company, engaged in a tough contest against the elements, is performing difficult, specific tasks. But specialized training is conducted in a tranquil shore environment. One does not feel the ocean's salty breath during training classes and drills. Leader personnel devote increasing attention to certain general problems, detached from the crew's daily concerns.

Does one need to argue that little benefit is derived from such activities? Nor do the men have much interest in them. The situation is entirely different if in the course of training one is dealing with that which is close to the men, those problems which they constantly encounter at sea. I believe that those commanders who, upon putting out to sea, advance to the forefront those matters connected with operating and servicing combat equipment in extreme operating modes, in difficult climatic conditions, with elevated humidity and salt, with correcting malfunctions which can occur at sea, and with mastering safety procedures are proceeding correctly.

Perhaps there are those who will retort that we have clear and specific documents on specialized training, which must be followed to the letter. But program is not dogma. And I do not believe that one can reproach a person conducting training if he makes intelligent adjustments in training proceeding from the specific tasks assigned to the men, if he gives specialized training, so to speak, a sea-duty coloration.

The ocean is constantly "warming up" the men's interest in technical knowledge. Situations sometimes arise at sea which, even with a high degree of inventiveness, one cannot foresee back in base and rehearse in training classes and drills. This also must be utilized in the interests of increasing the men's knowledge and skills. I recall the following incident. After a ship had been at sea for quite some time, insulation resistance in a piece of equipment unexpectedly came free. It was a rather unusual occurrence. WO A. Komlev, an experienced specialist and veteran of many extended cruises, was instructed to correct the problem. But he did not work alone. Several young seamen worked with him. And the point is not that Komlev could not have handled the problem by himself. This was an opportunity for the men to receive practical experience in making repairs.

A tradition in the fleet is gaining increasingly widespread acceptance by the men -- to boost their proficiency rating by one grade on each extended cruise. This attests to the fact that specialized training is being conducted steadily better and more effectively on ocean cruises. But it would be erroneous to assume that the methodology has assumed final form, that the ocean maximum has been achieved.

Take the following item, for example. Some crews while at sea must not only prepare for proficiency rating tests but also take them. We must admit that many such tests, conducted away from base, are not conducted at an adequate

level. Some line officers prove unprepared for the role of impartial, firm examiners. The organizational aspect of things also sometimes suffers.

The ocean is an excellent school. The very conditions of being at sea foster the men's ideological and moral growth and help them develop excellent moral-fighting qualities. It is our duty to do everything we can to ensure that each and every cruise becomes another step upward toward a high proficiency rating.

3024
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DOSAAF AND MILITARY COMMISSARIATS

DOSAAF PILOT TRAINING PROGRAM DISCUSSED

Moscow SOVETSKIY PATRIOT in Russian 24 Aug 83 p 3

[Interview by SOVETSKIY PATRIOT Correspondent: "Steps to the Sky"]

[Text] At the end of last year SOVETSKIY PATRIOT published an article by M. Kirsanova, Master of Sport International Class: "How Can Stagnation Be Avoided," concerning the fact that not enough attention is paid in aviation training organizations to aerial sports.

There were many responses. Sportsmen, instructor pilots and chiefs of aviation sports clubs gave their opinions.

Our correspondent met with Yu. Novikov, deputy chief of the USSR DOSAAF Central Committee Aviation Training and Sports Directorate, and asked him to answer a number of questions.

[Question] What is your opinion about the discussion contained on the pages of the paper concerning further improving sports pilot training?

[Answer] In my opinion the discussion was undoubtedly useful. I read all the published materials with interest and must thank the comrades who gave their opinions on the pages of the paper. All had the same concern -- how to ensure that the skill of sportsmen pilots improves constantly; that there are no so-called empty flights; that each hour in the air helps improve piloting techniques and is a step forward for all.

The USSR DOSAAF Central Committee Aviation Training and Sports Directorate is taking effective steps to eliminate existing shortcomings. We must not mark time, satisfied with our achievements. I believe that it is completely realistic to fulfill the norms of a sportsman pilot first class, or even a master of sport, in four years. And under some circumstances this period can even be reduced.

What is being done now to improve matters everywhere? As is well known, recently aerial clubs have been shifting to new aircraft, the YaK-50 and YaK-52. Soon another model, the YaK-53, will begin to be used. Flight training courses are designed primarily to ensure flight safety and constantly improve the skill of sportsmen.

A. Maksimov and I. Zharikov fully support the statement in Kirsanova's article that the program of training for competition should be set up depending on the skill and experience of each individual sportsman. They say that it is not necessary to require 20 hours of training from each pilot before competition. We have considered this desire, which has also been stated previously by other sportsmen. The 1983 provision on conducting aerial sports competition states that the number of hours of flight required is determined for each sportsman by the leaders of the aviation organization. The skill of each competitor is considered individually.

[Question] V. Smolin, world aerobatic flying champion, took part in the discussion. In a 17 April 1983 article entitled "Spread Your Wings," he writes that at present training of aerobatic flying instructors is incomplete. Pilots of the Central Aerial Club imeni V. P. Chkalov are being partially retrained on the two-seater YaK-52 aircraft, which is capable of executing vertical figures and difficult turns, but are flying reverse aerobatics only in combined groups.

[Answer] Yes, Smolin is right when he advises us not to forget about such important results of the work of aviation sports clubs as the number of competitions carried out and the training of highly rated sportsmen.

Can we accept a situation in which even ordinary competition such as in independent circular, route or zone flights with a judge on board are presently rarely conducted, while in the past these were established frequently all over?

It would be good to revive this good tradition. No one has banned intra-club competition. Obviously everything depends on local initiative. We will only welcome good undertakings. We must conduct more competitions among first and second rank sportsmen and masters of sport, and set up matches between aerial club and aviation sports club teams. These aerial tournaments will help to determine skill level.

The Volchanskoye Aviation School for DOSAAF pilots is also justly criticized. True, it provides excellent theoretical and methodological training for future instructors. However, it is not up to contemporary requirements of flight training in piston-engine aircraft. Therefore, young instructors come to aviation sports clubs not fully qualified in aerobatics. It has become necessary to graduate aviation sports instructor pilots qualified in the entire arsenal of forward and reverse aerobatics.

Is it normal that neither students nor pilots from the Volchanskiy School have ever responded to the invitation of the USSR Aircraft Sports Federation to participate in zonal and all-union aerobatics competition? And they are to be working in the clubs. We insistently advise the school's leaders to pay attention to sports, so that during their years of schooling the students participate in various competitions and arrive at the aviation sports clubs holding high sports ranks.

[Question] There are letters which were not published. A. Demchenko and V. Zaytsev propose that young men and women 16 years of age be allowed to begin flight training, while M. Ryzhkov, in contrast, advises that the qualification age for those beginning air sports be set at 25 years.

[Answer] We are currently taking steps to lower the age requirement for beginning aerial sportsmen. We will examine this question along with the USSR Ministry of Health.

Now about Ryzhkov's proposal. He favors accepting people into the aviation sports clubs at 25 years of age. But if a young person dreams about becoming a pilot from his childhood, he tries to join even earlier, say at 18 to 20. And we allow it up to 23. Is it necessary to lower the age requirement?

Master of Sport International Class Kirsanova also complains in her article, "How Can Stagnation Be Avoided," about other age limitations for aircraft sports. Yes, we have a provision stipulating then when one reaches 30 and has not obtained a higher sports rank he is no longer allowed to fly. However, this point must also be taken on a strictly individual basis, to see whether a sportsman stopped improving through any fault of his own. If not, he should be given another chance to reach the cherished goal, so that he is not removed from the skies. This would be right.

Our goal is first of all to give broad opportunities to young people, so that they become accustomed to flying already during childhood. It is necessary to open more schools for young pilots and glider pilots. This permits determining already at this stage how seriously the boys want to "conquer the fifth ocean," and whether their attraction is just happenstance.

[Question] Master of Sport S. Krikalev and former glider pilot-instructor V. Morozov, now a veteran of labor, suggest that aircraft sports be more popularized. They ask whether there are many people who know the champions and prize-winners. Do the viewers understand the subtleties of aerobatic sports?

[Answer] I agree with the authors. We must more widely and vividly propagandize aerial sports. We are all striving to write about them more in newspapers and journals, so that radio and television will more often cover this important theme.

We are also looking more strictly at ourselves. For example, what specifically is being done by our aviation sports clubs and DOSAAF committees to give young people a distinct impression of aerial sports? Are talks and lectures being conducted? Are meetings being arranged with these same champions and prize-winners? I would not be wrong to say that there are many places where this is not being done.

Before the war there was a parachute tower in every city, even the small ones. Familiarity with the parachute began from such towers. Now there are no more than one or two such towers. Clubs could participate in the most direct possible way in building towers.

An aerial sports holiday was organized on the eve of the opening of the 8th USSR Summer Games in Bryansk. Sportsmen of the Bryansk Aviation Sports Club also participated actively in conducting the holiday. It goes without saying that

the organizers were concerned with many things. However, their troubles did not frighten them, and everything was accomplished as required.

Aerial holidays and parades also took place recently in a number of other cities. It would be good to have them more often.

In summary, we find that the letters to the editor will help us see unused reserve capabilities and improve the training of sports aviators.

9069
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MILITARY DOCTRINE OF MAIN NATO COUNTRIES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 83 (signed to press 19 Jul 83) pp 16-22

[Article by Capt 1st Rank A. Karemov and Reserve Colonel G. Senin: "Military Doctrines of Main European NATO Countries"]

[Text] FRANCE'S MILITARY DOCTRINE.

In the post-war period, France's military doctrine has been formed under the influence of her participation since 1949 in the North Atlantic bloc, and by changes in the policy of the ruling classes, the country's economic capabilities, and the development of the means of armed conflict. Until the end of the 1950's it was governed by NATO's coalition military strategy. It was based on the concept of "directional defense;" that is stress was placed on preparing for war jointly with the other bloc countries against the Soviet Union as the main and only enemy.

In the early 1960's the de Gaulle Government began to conduct a policy aimed at ensuring French independence (most of all from the United States) on both global and regional levels, and on strengthening its role in European and international affairs. De Gaulle argued that it was necessary to reestablish sufficient sovereignty so that all French armed services would be subordinated only to national leadership. In its 1966 decision to leave NATO's military organization, the French government was guided by its desire for an independent military policy and for occupying a leading position in Western Europe.

The reexamination of the foreign policy of the state influenced its military doctrine, which became more independent. The strategy of "containment and deterrence" envisioned ensuring the country's defense "on all azimuths." During that period the Soviet Union was not viewed as the main enemy as it had been previously and as was customary in NATO. During that period the French command believed that a confrontation of the two systems would not necessarily involve France if her direct interests were not affected. Not only the potential enemy (USSR), but also France's neighbors and allies could threaten the country's interests. France could be subjected to military attack from Western powers following a dual aim: to prevent enemy seizure of French territory, or to use the military and strategic objectives and resources of the country in their own interests.

French military theoreticians assumed that armed conflict in Europe between the Warsaw Treaty Organization and NATO could arise only in the form of a general nuclear war. The primary resource for attaining the main goals of such a war were considered to be strategic nuclear forces, which were to be employed massively, to the full depth of the enemy's territory. France could enter such a conflict on the side of the North Atlantic Bloc.

To gain and strengthen its independence, France concentrated its main efforts on developing its own strategic nuclear forces. During the 1960's France developed strategic aviation, sea-based nuclear forces, and squadrons of intermediate range ballistic missiles at the Apt Missile Base.

The class interest of the country's ruling circles did not allow them to take their desire for independence all the way to complete withdrawal from NATO. France continued to remain a member of its political organization and maintained broad military cooperation with the European bloc allies on a bilateral basis.

In early 1969 the French leadership rejected the concept of "defense on all azimuths" and returned to the concept of "directional defense."

In the mid-1970's the concept of a so-called "expanded security zone" was adopted. It had been developed by General G. Meri, chief of the French Armed Forces General Staff. In accordance with this concept, the region of French "vital interests" is not limited to national territory, but includes all of Western Europe and its approaches, including the Mediterranean Sea basin and several other regions of the world.

In accordance with this concept, participation of French armed forces in military operations against the countries of the socialist community on the "front lines" in Central Europe, that is, the Eastern borders of the FRG, is not excluded. Its author asserted that French armed forces would participate in military operations on forward defense lines which should be built within the framework of a united Europe. In his opinion, it was difficult to imagine a European defense without Americans. However, as the foreign press emphasizes, any coordination of French forces with the bloc's Combined Armed Forces will be accomplished after an appropriate decision of the French government.

Alliance with NATO is viewed as a most important means of preserving the positions of the national bourgeoisie under conditions of an aggravated class struggle and the strengthened influence of leftist forces within the country. On a regional plane, this cooperation is related to the desire of French imperialist circles to attain leadership in Europe in the competition with Great Britain and the FRG, and to reduce the role of the latter in NATO.

In the opinion of the current French leadership, the military problems of Western Europe can be solved by the combined efforts of the Western European countries with the direct participation of the U. S. and its armed forces. Therefore, the direction of military preparation of her armed forces, in the opinion of foreign military specialists, corresponds to the current

requirements of the present NATO coalition military strategy of "flexible response" and the concept of "forward defense".

Changes in views on nuclear operations have also occurred. The principle of immediate mass use of strategic nuclear weapons was replaced by "phased containment," which envisioned the sequential use, first of conventional forces and weapons, then tactical nuclear weapons, and only after this, if the threat to French interests remained, the use of strategic nuclear forces. This demonstrates the readiness of the country's military and political leadership to use all its weapons, right up to strategic.

According to the foreign press, in mid-1980 a discussion of a report on French military doctrine took place in France, which essentially approved the above mentioned statements of General Meri. Doctrinal precepts concerning the possible nature of future war in Europe were clarified. It was acknowledged that a general nuclear war or a limited war using nuclear or exclusively conventional weapons could arise between NATO and the Warsaw Treaty Organization countries. It also allowed for French armed forces to conduct local wars in fulfillment of alliance commitments to its former colonies in Africa, Asia and Latin America. For example, at the present time France has treaties on mutual assistance with seven African states.

The construction of French armed forces is being implemented of late in accordance with five year programs for armed forces construction. The country's nuclear missile capability is being increased, and a fundamental reorganization of general purpose forces is being carried out. French armed forces consist of ground, air and naval forces, and some foreign specialists also include the military gendarmery. By operational and strategic functions they are divided into strategic nuclear forces, tactical nuclear forces and general purpose forces in accordance with their military doctrine. In connection with the reform, their former division into strategic nuclear forces, combat forces, intervention and naval forces, and security forces has been eliminated.

According to the foreign press, strategic nuclear forces (approximately 20,000 personnel) consisted in early 1983 of two squadrons of land-based S3 intermediate range ballistic missiles (18 launchers) with one megaton yield single warheads; five nuclear missile submarines having 16 M20 missiles each (firing range up to 3,000 km; one megaton yield single warhead); and six squadrons of medium bombers (34 aircraft) each capable of carrying one nuclear bomb with 70 kt yield. In all, French nuclear forces (not counting tactical) have 132 launchers which can fire in one launch (takeoff) 132 nuclear weapons having an overall yield greater than 100 mt. By 1985 it is planned to commission a sixth SSBN with M4 missiles (firing range up to 4,000 km; nose cone with six warheads of 100 - 150 kt each), and to replace existing M20 missiles on SSBN with these missiles. Strategic nuclear force construction plans envision increasing the number of such submarines to seven, and also continuing improvement of tactical technical characteristics of other weapons.

Tactical nuclear forces include 5 regiments of Pluton guided missiles, which have a total of 30 launchers and are found in the ground forces; 5 squadrons of

fighter-bombers (45 Jaguar-A and 30 Mirage 3E) in the air forces; and 3 squadrons of Super Etendard carrier aircraft (36 aircraft) in the navy.

French military specialists believe that the personnel strength of the general purpose forces must be such as to attain equilibrium within NATO. This presumes that their capabilities must be equal to those of the armed forces of the other Western European countries, especially the FRG. Based on these requirements their overall strength is approximately 475,000 personnel (318,000 in the ground forces, 93,000 in the air forces, and 64,000 in the navy) of which approximately 275,000 are temporary personnel who are called up for a designated term of service.

The armament of these forces include approximately 1,200 medium tanks; more than 3,600 armored personnel carriers, infantry fighting vehicles and armored cars; approximately 450 field artillery guns; up to 520 combat aircraft; and 170 ships, excluding SSBN. The ground forces number 15 divisio.s, eight of which are armored.

In accordance with its military doctrine, France occupies a unique position among the NATO partners which is somewhat independent and isolated. It retains the right to use its armed forces during crisis situations according to its own discretion. But the combined armed forces command considers them its reserve, and takes them into account in planning all military measures in Europe. Thus one highly placed NATO general stated directly that French military might, whether or not it is integrated into NATO, serves the interest of the North Atlantic Alliance, and its nuclear forces make a significant contribution to its strength. In this way France is reminded about its alliance commitments and responsibility.

Cooperation of the French armed forces with the NATO Combined Armed Forces is developing along many lines, including coordination of strategic and operational plans, coordination of reconnaissance and combat service support, and other matters. There are French military missions in all the main NATO headquarters and their forces participate in exercises and maneuvers, especially air and naval, along with other countries. France takes part in the Combined NATO Air Defense Command and Control System in Western Europe, and in joint development and production of a number of models of weapons, etc.

Nevertheless, France retains independence in the area of use of its nuclear weapons and armed forces as a whole. Defense Minister C. Hernu stated in an interview in LeMONDE: "France's defense is her nuclear deterrence forces... France is a member of the North Atlantic Alliance and we plan to deepen our relations with it, but preserve our independence in decision making, in order not to be automatically drawn into a conflict in which we do not wish to participate."

In order to "deter" a probable enemy, the country's military and political leadership adhere to a concept of conducting nuclear strikes against major industrial, political and administrative centers, and, mindful of the limited capabilities of their nuclear forces, believe that it is enough to destroy a certain number of the vitally important centers of any state for it to cease to

be an organized society for decades. According to data of French specialists, such centers number, for example, 54 in the U. S., 11 in the FRG, and 12 in France.

The present French leaders view French strategic nuclear forces not only as national means of deterrence, but also apparently envision their use jointly with NATO. Thus, French President Mitterrand in an interview in the West German journal STERN stated: "The USSR has superior armed forces in Europe. However, the U. S. has means of reestablishing equality in the correlation of forces, and France will unhesitatingly supplement them with its own weapons of deterrence." The Western press also reports, for example, that the French SSBN patrol areas are coordinated with the American command.

The French command believes that all its general purpose forces large units and units must be prepared to conduct combat operations both within the borders of its own country and beyond. However, some of these units (11th Airborne, 9th Infantry "Marin" divisions) are better prepared and equipped for operations on foreign territory. They are maintained at a higher level of combat readiness, and along with a portion of the air force comprise the so-called "rapid reaction forces." The foreign press assesses their strength at 25,000 - 35,000 personnel.

France retains its military advisors and separate troop garrisons, numbering up to 14,000 personnel, in many African countries. These may be used in times of emergency as an advanced guard of the "rapid reaction force." Some of their heavy weapons are stored in probable areas of their deployment, such as Djibouti.

The French military and political leaders pay considerable attention to field training, improving the level of readiness of reserve components, expanding large units and units to wartime strengths, improving the coordination of the military services, and matters of troop movement and supply.

ITALY'S MILITARY DOCTRINE. The formation of Italy's military doctrine is greatly influenced by the anti-sovietism of reactionary Italian forces as well as all world imperialism, and their desire to obtain decisive superiority over the Soviet Union and the other states of the socialist community. The basis for Italy's doctrine, as of that of many other members of the North Atlantic bloc, is NATO's coalition military strategy of "flexible response," in accordance with which the Soviet Union is unambiguously declared the primary enemy. Their doctrine determines the direction of military construction, the requirements for combat and operational troop training, the deployment of armed forces groupings, and the basis for their conduct of combat operations.

In training for and conducting a future war in Europe, the Italian command, like NATO as a whole, is guided primarily by bloc interests, within which, according to the country's leadership, they can achieve their assigned combat missions against the probable enemy. At the same time, the ruling circles of the country try to strengthen Italy's position in Western Europe, and especially in the Mediterranean Basin, under cover of the need to defend bloc interests.

Italian doctrine envisions the possibility of conducting general nuclear war and limited wars against the USSR and its allies.

According to foreign specialists, the former may arise between the primary opposing forces and be conducted as a coalition war, global in scale, with unlimited use of all available forces. Primary means of conducting such a war are considered to be the strategic nuclear forces of the U. S., Great Britain and France, with simultaneous or sequential use of tactical nuclear forces in combat operations (nuclear weapons are located in Italy), and NATO's general purpose forces. The primary political goal is to destroy the socialist system.

A limited war is a war not reaching the scale of general nuclear war. It is conducted with limited objectives, smaller numbers of forces and equipment, in particular areas, and with a limited number of participating countries. However, in such a war the armed forces face the tasks of eliminating socialism in one or several socialist countries and weakening the entire socialist community. The Italian leadership views such an armed conflict not as an independent war, but as a stage of escalation to general nuclear war. The foreign press emphasizes that in approving the NATO decision to deploy cruise missiles and intermediate range ballistic missiles on the territory of Western Europe including Italy, the Italian leadership in fact departs from the above mentioned thesis of a limited war escalating to a general nuclear war. These new offensive weapons are capable of striking targets inside USSR territory, and thus NATO's combined armed forces can accomplish strategic missions without resorting to the use of U. S. strategic nuclear forces. Therefore, now many foreign specialists no longer view limited war in Europe as an escalatory stage on the threshold of general nuclear war. It acquires an independent and special nature. It is advantageous to the Reagan Administration to limit it within the boundaries of the European theaters of military operations.

In recent years Italian military specialists have been fighting to raise the "nuclear threshold" by increasing the combat capabilities of general purpose forces. In their opinion this would permit conducting combat operations in Europe without the use of nuclear weapons for a longer period of time, and possibly even achieving their primary political objectives.

In accordance with their doctrine, Italy's armed forces also must be prepared to participate in local military conflicts which do not directly affect the interests of the North Atlantic bloc. According to foreign specialists, such a conflict may arise either in areas contiguous to the Mediterranean Sea, or in areas remote from the NATO "zone of responsibility." For example, recently Italy's ruling circles have shown increased interest in the Horn of Africa, believing that it "has acquired important strategic significance." With these aims in mind, the Italian command and headquarters are developing a so-called "national defense model." It orients the armed forces toward preparing for a local war, the main objective of which is to secure Italian interests in the indicated regions.

In recent years increasing the mobility of the armed forces and their capability to quickly begin combat operations outside of Italian territory has been envisioned in accordance with this "model." Creation of a "rapid deployment

force" (modeled after the American, but smaller) has been proposed, which could be used for interference in the internal affairs of the states of the Mediterranean Basin and the Middle East.

Preparing the country's economy for war and equipping its territory is carried out primarily taking into account the requirements of the military and political leadership of the North Atlantic bloc. Italy's importance for NATO is determined by its favorable strategic location on the southern flank of the bloc, its large population, and also its rather developed economy. From Italian territory, NATO's Combined Armed Forces can conduct nuclear strikes against targets located in the European socialist countries, control the sea lines of communication in the Mediterranean Sea, and threaten the southern flank of the military formation of the Warsaw Treaty Organization. Therefore, its territory is equipped in accordance with the infrastructure plans of the North Atlantic bloc. The headquarters of the main command of NATO's Combined Armed Forces in the Southern European Theater of Military Operations (TVD), and the shore headquarters of the naval strike forces in the TVD are located here.

There are more than 50 airfields suitable for basing of modern aircraft on Italian territory, 25 of which have been transferred to NATO control. They have an operational capacity of up to 900 aircraft. There is a system of military pipelines in northern Italy which joins a similar system in the Central European TVD. Positions for American cruise missiles are being built in Sicily.

Foreign specialists believe that Italy has relatively powerful armed forces (total strength of 370,000 personnel) which are maintained at a high level of combat readiness.

The ground forces, numbering 257,000, are the primary and largest armed service. They include 3 army corps headquarters, 4 divisions (1 armored), 12 separate brigades, and a separate Lance Guided Missile Brigade. They have modern combat equipment -- approximately 1,800 tanks, up to 1,100 field artillery guns, 4,200 armored personnel carriers and armored cars, and approximately 480 army aviation aircraft and helicopters. If necessary they can be rapidly filled out to wartime strength, for which more than 550,000 first line reservists have been trained.

The air forces, which number 69,000 personnel, are organized into air wings (17 combat aircraft squadrons), which have approximately 260 aircraft. All Italian military aviation has been transferred to NATO's 5th Combined Tactical Air Command.

The navy, numbering 44,000 personnel, includes the fleet, naval aviation, and marines. It has more than 110 warships and patrol craft, 2 patrol squadrons (14 vessels) and 5 helicopter squadrons (up to 90 helicopters). Italian navy training pays particular attention to increasing combat readiness and practicing missions which they will accomplish as a part of NATO's naval forces.

The president of the republic is the supreme commander of Italy's armed forces. Through a supreme defense council he controls and coordinates the activities of

governmental bodies on questions of preparing the country and its armed forces for war. According to its North Atlantic bloc commitments, it is envisioned that in the event a general nuclear war or a limited war breaks out, Italian armed forces will conduct combat operations as a part of NATO's Combined Armed Forces in the Southern European TVD. Assessing the capabilities of their armed forces in a limited war, the Italian military and political leadership believes that the armed forces can withstand the probable enemy in conducting combat operations without the use of nuclear weapons.

Armed forces training is accomplished in accordance with the basic provisions of the "forward defense" concept, which requires maintenance of high combat readiness and rapid troop mobilization and operational deployment. In conformity with the NATO Long Term Military Program, Italy is improving the combat capabilities of its armed forces by refitting them with new equipment. In particular this provides for the introduction into units and large units of the West German Leopard tanks and anti-tank weapons, 100 new Tornado aircraft, modern air defense equipment, and strengthening army aviation by introducing new fire support helicopters.

The main grouping of Italian armed forces is deployed in the northern and northeastern portions of the country in readiness to conduct combat operations in coordination with NATO's Combined Armed Forces in the Central European TVD.

It is believed that Italian ground forces, with the support of air and naval forces, can conduct strategic offensive and defensive operations. According to Italian military doctrine, the offensive is the primary method of conducting military operations, and it may be carried out beyond the borders of national territory. With respect to enemy offensive operations, Italian armed forces are to be used in defensive operations in order not to permit the incursion of foreign ground forces into the northern part of the country, or assault landings in the south. The main objective of the defense is to destroy the enemy and create, along with NATO Combined Armed Forces in other TVD's, conditions for a shift to the offensive.

Thus, Italian military doctrine in the area of armed forces construction, combat and operational training, and planning of operations envisions primarily coalition operations with reliance upon its more powerful allies (U. S., Great Britain, and FRG).

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In conclusion, it should be noted that the military doctrines of the main NATO countries (Great Britain, FRG, France, and Italy) have a common class essence and an aggressive anti-soviet, anti-communist thrust. They reflect identical views on the nature of possible war in Europe and its objectives, and in the main follow the provisions of NATO's coalition strategy and American doctrine.

One of the differences between American military doctrine and the doctrines of these countries is the incongruity of their views on the use of nuclear weapons in Europe. The former, considering parity between the U. S. and USSR in strategic nuclear weapons, allows within the framework of a war not reaching

the level of a general nuclear war, for the possibility of confining to Europe either a conventional war or a nuclear war which employs nuclear weapons located within the European Theater of War, and does not include American strategic offensive forces. The European countries of the North Atlantic bloc view these types of wars as stages in the escalation of a military conflict (in accordance with the requirements of the strategy of "flexible response" and the concept of "forward defense") with the initial use of conventional weapons and then nuclear weapons, including strategic.

However, the leadership of the European NATO countries, which under pressure from Washington in December 1979 adopted a decision on the deployment in Europe of American intermediate range nuclear weapons, have agreed with the new U. S. doctrine. Using every possible effort, they want to instill in people that nuclear war supposedly can be limited, and to reconcile them with the thought of the permissibility of such a war. But this is an out and out deception of their peoples. For, according to American concepts, a "limited" nuclear war, for example in Europe, would at its very outset mean the certain destruction of European civilization. And the United States itself could not remain apart from the flames of war. Therefore, such plans and doctrines are a serious threat to all peoples without exception.

The Soviet Union tirelessly struggles to strengthen peace throughout the world. But the aggressive designs of U. S. and NATO adventurists force the CPSU to show constant concern for strengthening the defense capability of the country. Soviet soldiers, along with those of the fraternal socialist republics, vigilantly stand watch over the gains of socialism, and are always prepared to give a crushing rebuff to any aggressor. "Our retaliatory steps," emphasized CPSU Central Committee General Secretary Yu. V. Andropov, "will be fully justified from any point of view, including according to the highest moral standards."

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PERCEPTIONS, VIEWS, COMMENTS

PRODUCTION OF U. S. CHEMICAL WEAPONS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 83 (signed to press 19 Jul 83) pp 27-30

[Article by Lt Col F. Vladimirov: "U. S. Production of Paralyzing Nerve Agent Chemical Weapons"]

[Text] In recent years U. S. ruling circles, striving to achieve military superiority over the USSR, have significantly increased their efforts to develop and stockpile new types of weapons of mass destruction, including chemical weapons. Exploiting the myth about the "Soviet threat," the Reagan Administration and the bosses of the military-industrial complex have set out to expand production of various types of military toxins and to equip specialized U. S. armed forces sub-units with them.*

On 19 February 1982, TASS stated: "...President Reagan has proclaimed a multi-billion dollar program of 'chemical rearmament' of the U. S. The tremendous reserves of toxins -- yet another monstrous weapon of mass destruction of people -- have become too small for the American Government it turns out. Now it is planned to equip the U. S. armed forces with several million shells filled with a new, still more deadly paralyzing nerve compound (so called binary munitions)."

To achieve these aggressive aims, the American militarists plan to widely use paralyzing nerve agent toxins belonging to the class of phosphororganic compounds. Study of the prospects of using these compounds for military purposes began already in the 1930's in Italy and Germany, where sarin had been obtained and the technology for its industrial production developed by the start of World War II. During the post-war period, as a result of U. S. research of the mechanism by which phosphororganic toxic substances (FOV) influence living organisms, the theory of toxicology was developed. This made it possible to develop new types of toxins, from which were chosen highly toxic compounds designated VX. It is namely VX and the well known sarin (GB by U. S. classification) which comprise the basic arsenal of paralyzing nerve agents in the U. S. armed forces. In their action on humans, they first destroy the nervous system and lead to breakdown of the internal organs. Although less toxic than substances in the toxin class (botulinum toxins, saxitoxins,

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*For more detail on U. S. Army chemical weapons see ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, 1982, No 10, pp 35-41 (ed.).

staphylococcus enterotoxin and others), FOV do have a very strong effect on humans and may be fatal even in micro-doses. Falling on the body, VX takes effect in a few minutes to one hour depending on various conditions. The initial symptoms are suffocation, excessive perspiration, vomiting, loss of vision, etc.

Pentagon militarists are attracted to these barbaric weapons of mass destruction of people due not only to their high toxicity, but also to the relative ease with which they can be synthesized, their low cost, and the possibility of obtaining them in large quantities and using them in delivery means of all types, such as aerial sprays, cluster bombs, missile warheads, artillery rounds, chemical mines, etc., due to their physical and chemical properties.

The active development of methods of synthesizing FOV, and the study of their combat applications began already in 1946 in the U. S. The results of research conducted in Fascist Germany were widely used.

In 1950 the U. S. Army chemical service developed a special program to step up scientific work and coordinate the production of toxins with their entry into military service. In accordance with this program it was planned to develop FOV in three main military-chemical industrial enterprises. The factory in Mussel Shoals, Alabama produced intermediate products for further synthesis of FOV. Its construction was completed in 1953, but improvements to the technological processes aimed at increasing the output of semi-finished products took place until 1955. The enterprise was in operation for three years and employed more than 1,000 people. Upon completion of the program for creating significant stocks of products for synthesis of paralyzing nerve agent toxins, the factory was placed in reserve. But even today it has the necessary equipment to resume production.

The factory at the Rocky Mountain Military-Chemical Arsenal in Denver, Colorado synthesized sarin using the semi-finished products obtained from the factory at Mussel Shoals. It was most active during the period March 1954 through August 1957. During this time more than 2,000 people were employed at this enterprise and more than 50,000 tons of toxic agents were synthesized, which were used to load chemical munitions and create mobilization reserves.

The state military-chemical factory in Newport, Indiana was opened in 1961 to produce VX. From 1961 - 1967 approximately 5,000 tons of toxic substances were developed, part of which were used to fill chemical munitions right at the factory. The number of people employed there reached 300. In 1969 the factory was placed in reserve, but, as in Mussel Shoals, the presence of equipment makes it possible to rapidly resume production there of toxic substances.

Filling chemical munitions takes place primarily in shops at military-chemical arsenals located in Edgewood, Maryland, Pine Bluff, Arkansas, and Denver, Colorado, and also in a number of state factories. According to the foreign press, approximately one-fourth of the stocks of paralyzing nerve agent toxins produced in the U. S. are contained in munitions, and the remainder are in bulk storage in 11 military-chemical depots.

Officials try in every way possible to conceal the scale of production of chemical munitions in the U. S. However, according to estimates of foreign specialists, American troops have in armament at this time 3 million artillery shells (filled with GB and VX toxins), several thousand 500 and 750 pound bombs (GB), hundreds of thousands of 2 gallon chemical mines, and approximately 1,500 160 gallon aerial spray containers (VX). According to the latest Western press reports, there is an overall total of 150,000 tons of filled chemical munitions. According to U. S. representative K. Zablotski, this quantity is enough for "50 divisions to conduct chemical warfare for 100 days, as a result of which hardly anyone in Europe will remain alive." Including those remaining after World War II, the total stockpile of military toxic substances in the U. S. (including bulk storage) is assessed at approximately 300,000 tons.

The development of binary munitions is one of the main improvements in chemical weapons in the U. S. in recent years. According to American press reports, their operating principle is as follows. Thin walled plastic containers with FOV and higher alcohol, separated by a graphite plate and a catalytic agent, are arranged in the shell. Each component individually is non-toxic or mildly toxic. The impact at the moment of firing breaks the walls of the containers and the graphite plate, the components are mixed and produce a reaction, as a result of which toxic substances GB-2 or VX-2 (binary sarin and VX) are obtained, depending on the composition of semi-finished products. The acceleration of the reaction causes the shell to rotate in flight at 15,000 revolutions per minute.

According to the foreign press, the most active research into physical and chemical properties of binary toxic substances, methods for obtaining them and possible applications took place in the U. S. durin_ 1975-1980. The main efforts were concentrated on solving the following problems: increasing the effect of paralyzing nerve agents on humans; methods and techniques of their dispersion (formation of fine droplets) and dissemination; resistance of FOV and binary munitions to explosion; reducing reaction time and speed of condensation of toxic substances; obtaining a binary substance with volatility between that of GB-2 and VX-2; studying the ballistic characteristics of munitions filled with binary toxic substances; designing production lines for filling munitions; solving problems of hermetic sealing, etc.

Construction of series production enterprises for filling more than 700,000 artillery shells and aerial bombs annually with binary toxic substances is underway at the Pine Bluff Military-Chemical Arsenal. Production of new type munitions is planned to begin in 1984-1985. Construction costs exceed $170 million. In the opinion of General David Jones, former chairman of the U. S. Joint Chiefs of Staff, the arsenal at Pine Bluff must also be able to manufacture Big Eye aerial chemical bombs, 203.2 mm artillery rounds filled with VX, and chemical munitions multiple rocket launcher systems. In the future it is planned to produce binary warheads for Lance and cruise missiles. Striving as rapidly as possible to equip its armed forces with the latest chemical weapons, the U. S. government spares no resources. Thus, in Fiscal Year 1981 Congress allocated $3.2 million for preparing to produce binary munitions at the Pine Bluff Arsenal alone. As the next step, in 1982 $20 million were allotted to develop 155 mm binary chemical munitions. There are plans to spend another

$155 million by 1984 for production of such weapons. In the future the U. S. and NATO armed forces leadership intend to replace existing mobilization reserves of paralyzing nerve agent toxic substances with binary shells. According to foreign specialists, implementing this program will require the expenditure of more than $1 billion, 35-40% of which will be for destruction of obsolete supplies of toxic substances, 10-20% for scientific research and design, and 30-45% for purchase of binary munitions. According to the Western press, during the next five years the Reagan Administration plans to spend a total of $6 billion on preparations for chemical warfare, and the overall expenditures on chemical rearmament in the U. S. are estimated at $7-10 billion.

In addition to the funds for the chemical weapons improvement program, the Pentagon allots significant sums (in 1983 more than $500 million) for the development and purchase of equipment for individual and collective protection, chemical reconnaissance instruments, compounds for decontamination of weapons and military equipment, and also for personnel training (Figures 1 and 2).

Western Europe is allotted a special place in the plans of U. S. and NATO commands for equipping their armed forces with binary chemical munitions. The West German journal DER SPIEGEL asserts that a far flung network of storage sites for American made chemical weapons is already developed on FRG territory. Four thousand tons of paralyzing nerve agent toxic substances are stored at these sites (In the opinion of some foreign experts there are 10,000 tons of these stocks.). This quantity is sufficient to conduct chemical warfare in Central Europe for 1-2 weeks.

One of the major storage site for American chemical weapons in the FRG is that in the area of Pirmasens. The system of American and West German chemical weapons storage sites is shown in Figure 3. Before 1984, when the U. S. will begin series production of binary munitions, the FRG Government must make a decision on their deployment on FRG territory. The possibility of creating chemical weapons storage sites on the territory of other NATO member countries is also being studied.

The expanded production of a new type of toxic agent in the U. S. bears witness to the fact that, under the cover of false concoctions about supposed Soviet use of toxic substances in Southeast Asia and Afghanistan, the U. S. military leadership is nurturing plans for unleashing a war using not only nuclear but chemical weapons as well. A note of 5 April 1982 from the Soviet Government to the U. S. Government emphasized: "With the aid of inventions on the use of chemical weapons by the Soviet Government in Laos and Kampuchea, the U. S. would like to cover up the tracks of its monstrous crimes committed against the peoples of Indochina during the military intervention in that region. But the people remember this. They remember the hundreds of thousands of people who suffered from the effect of toxic substances which the American troops used on a wide scale in Vietnam, Laos and Kampuchea, and the irreparable harm inflicted by these substances on people, the economy, and the environment. All this is an irrefutable fact.

Рис. 1. Солдаты американской армии в защитной одежде и противогазах на учениях в Западной Европе

Figure 1. U. S. Army soldiers in protective clothing and gas masks during exercises in Western Europe.

Рис. 2. Дегазация оружия и снаряжения

Figure 2. Decontamination of weapons and personal equipment.

Рис. 3. Схема размещения американских и западногерманских складов химического оружия на территории ФРГ

Symbols:

- U. S. toxic chemical storage sites
- Chemical storage sites remaining after World War II

Figure 3. Locations of U. S. and West German chemical weapons storage sites on FRG territory.

"It is also a fact that bands of interventionists in Afghanistan are attempting to use American made chemical weapons. And there is material evidence of this which is well known.

"It is also obvious that the propaganda spectacle being performed in Washington is intended to attempt to distract attention from the plans stated by the American administration for large-scale production of new types of deadly chemical substances; that is, preparations for war using these barbaric weapons of mass destruction."

Measures taken by the American leadership for the development and utilization of new types of chemical weapons are an integral part of the intensified aggressive U. S. policy on the world arena, are leading to aggravation of the international situation and threaten the very existence of live on earth. All this obligates Soviet soldiers to keep vigilant watch over the intrigues of the enemies of detente and disarmament, persistently improve combat training, and be constantly prepared to give a decisive rebuff to the American and NATO adventurists.

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PERCEPTIONS, VIEWS, COMMENTS

ORGANIZATIONAL STRUCTURE OF U.S. ARMY DIVISIONS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 83 (signed to press 19 Jul 83) pp 31-35

[Article by Col V. Filippov]

[Text] Ground forces (in U.S. terminology--the Army) are one of the primary U.S. armed services. They are designed to conduct combat operations to defeat the enemy and seize and hold his territory. This is why the Pentagon assigns them an important role in implementing its aggressive plans both in general nuclear war and in limited military conflicts.

Divisions constitute the primary ground forces organization. They are found in the Regular Army and the Army National Guard. The division is considered the primary tactical and administrative formation. It includes sub-units of various branches and services, and can conduct combined arms warfare either independently or as an element of a larger formation or strategic formation. Depending on its mission, the division has an appropriate organization and weapons, which determine its type.

The organizational structure, effective combat strength and numerical strength of divisions change periodically and improve as views change on employment, new means of armed conflict appear, and also based on studying the experience of operations, exercises and maneuvers in various theaters of military operations.

According to the foreign press, there were 28 Army divisions prior to the 2d World War. During the war they were significantly increased in number, and by the end of the war numbered 89: 64 infantry, 16 armored, 8 airborne and 1 cavalry. The basic formation of this period was the infantry division (13,869 personnel). It included three infantry regiments, three battalions of 105 mm and one of 155 mm howitzers, and engineer, medical and quartermaster battalions. According to U.S. specialists, this organization was suitable for conducting combat operations, although it had serious shortcomings: the absence of organic air defense and tank sub-units, and insufficient anti-tank and field artillery. The armored division (10,670 personnel) included 3 tank and 3 motorized battalions, 3 battalions of self-propelled artillery, a reconnaissance battalion, engineer and medical battalions, and supply and repair battalions. The airborne division (12,979

personnel) consisted of 2 parachute regiments, a glider-infantry regiment, 4 battalions of light artillery, an air defense battalion, an engineer battalion and service sub-units.

Soon after the war the United States began to develop new organizational structures for its basic Army divisions and regiments. Their tables of organization and equipment [TOE] were approved in December 1946. Thus, the infantry division gained a tank battalion and an air defense artillery battalion, and the infantry regiments gained a tank company (in place of the anti-tank artillery company), a company of 106.7 mm mortars (instead of the regimental artillery battery), and a medical company. The number of guns in artillery batteries was increased from 4 to 6, and the personnel strength was increased to 17,710.

The armored division was organized with 4 tank battalions [sic] (tank strength increased from 272 to 361), 4 battalions of 155 mm howitzers (72 guns) and 1 air defense artillery battalion. Motorized infantry were increased from three battalions of three companies each to four battalions of four companies. A reconnaissance tank battalion replaced the reconnaissance battalion. In 1947 the airborne division was reorganized, as a result of which its personnel strength was reduced from 12,979 to 9,952. Two battalions of light tanks were added to the division, the medical company was reorganized as a battalion, and one of the two battalions of 75 mm howitzers was replaced by a battalion of 105 mm.

The experience of the Korean War forced the U.S. command to make some changes in the organization of tank sub-units, and increase the number of weapons in the heavy weapons company of infantry and airborne battalions found in infantry and airborne divisions.

In the mid-1950's special attention began to be paid to training ground forces for combat operations under nuclear conditions. Stemming from this it was recognized that the division needed more combat units capable of independent combat (but of smaller than regimental size). In the opinion of specialists this could permit the division commander to create various combinations of combat formations, corresponding to the rapidly changing situation. It was proposed that firepower be increased by introducing nuclear delivery means into the division and that mobility be increased by equipping it with substantial air and ground transport. At this time the TOE of the so-called pentomic division was also developed.

According to the new structure the infantry division consisted of its command element, main and reserve headquarters, five combat groupings, tank, reconnaissance, combat engineer and medical battalions, a communications battalion, division artillery, army aviation company, and service support sub-units. The airborne division included a command element, headquarters and headquarters battalion, five combat groupings, a combat engineer battalion, communications battalion, and division artillery. The reorganization made the airborne division completely airmobile.

The armored division underwent only minor changes since the Army command considered it to have sufficient maneuverability, a good balance of firepower and personnel strength, and also flexible command and control. To increase the firepower of infantry and armored divisions, the reorganization added batteries of Honest John free-flight rockets (two launchers each) and batteries of 203.2 mm howitzers (four guns) capable of firing nuclear munitions.

However, exercise experience showed that the pentomic division could not conduct effective conventional combat operations (without use of nuclear weapons). To eliminate this shortcoming some infantry divisions received individual changes in 1959, but favorable results were not obtained. In 1961 it was decided to abolish the pentomic structure, and again introduce a triangular structure for all types of divisions, but have brigades, not regiments, which must be organized for battle from an appropriate number of combat battalions. The new TOE was approved in 1962, and the divisions reorganized to it by 1964.

According to the foreign press, four types of divisions were created by the 1962 TOE: infantry, mechanized, armored, and airborne. They were characterized by a common division base and varying numbers of combat battalions (armored, mechanized infantry, infantry and parachute), which also define the division type. Brigades were made up of battalions (from two to five). All battalions of the same type have identical organizations.

During the aggressive U.S. war in Vietnam a new type division--airmobile--appeared which, according to the U.S. military leadership, best answered the requirements of this theater of military operations. In 1965 the 1st Airmobile Division [sic--1st Cavalry] was created from the 11th Airborne Division [sic--11th Air Assault Brigade], and in 1968 the 101st Airmobile Division was created from the 101st Airborne Division. Each had a division base and eight infantry (airmobile) battalions.

The divisional organizational structures were approved in 1962 and have been essentially retained to the present, although their improvement has continued constantly, primarily due to the introduction of new types of weapons and combat equipment, and the reexamination of certain views on division employment in the basic types of battle.

At the same time a search for a new type of division was going on. The experimental TRICAP (tri-capable) division was tested during 1971-1973. It was developed from the 1st Airmobile Division (from 1971 [sic] it was called a cavalry division) and units of the former 1st Armored Division. The new universal division, according to the U.S. command, was to embody the latest military and technical achievements and in the future replace some existing types of divisions. It included a division base and three brigades having set structures (airmobile infantry, armored and airmobile anti-tank). However, testing demonstrated that this division did not answer the requirements placed upon it, and work on this structure was discontinued.

In 1977 testing began on a so-called heavy division, which was to have 15 combat battalions (9 armored and 6 mechanized infantry). This test division was based on the 1st Cavalry Division (in 1975 it had been restructured into an armored division while retaining its traditional cavalry designation). It was envisioned that this division would have a significantly greater number of field artillery guns, anti-tank and air defense weapons, and army aviation helicopters. Troop testing of the division's units and sub-units, which took place during 1977-1980, did not live up to the expectations of the U.S. command, which anticipated improved combat capabilities, and further tests were curtailed.

According to the foreign military press, there are five types of divisions in the U.S. Army at this time: infantry, mechanized, armored, airborne and air assault (designated airmobile until 1976).* There are 24 divisions in all, including 16 in the Regular Army (2d, 7th, 9th and 25th Infantry; 1st, 3d, 4th, 5th, 8th and 24th Mechanized; 1st Cavalry; 1st, 2d and 3d Armored; 82d Airborne and 101st Air Assault) and 8 in the Army National Guard (26th, 28th 38th, 42d and 47th Infantry; 40th Mechanized; and 49th and 50th Armored). Most are deployed in the continental United States. Exceptions are six divisions located in other countries and areas of the world: the 3d and 8th Mechanized and 1st and 3d Armored in the FRG; 2d Infantry in South Korea; and 25th Infantry in Hawaii.

Existing divisions have similar organizational structures. Each consists of two main elements: a division base including permanent sub-units, and 9-11 combat battalions.

The division base contains: command element, headquarters, headquarters company, three brigade headquarters with headquarters companies, separate battalions (reconnaissance--airmobile reconnaissance in airborne and air assault divisions; intelligence and electronic warfare; communications; engineer; army aviation--an army aviation group in the air assault division; division artillery; Chaparral-Vulcan air defense battalion--pure Vulcan in airborne and air assault divisions), division rear, NBC defense company, and military police company.

The mix of combat battalions determines the division type. Thus, in an infantry division there are eight infantry, one mechanized infantry and one armored battalions; in the mechanized division six mechanized infantry and four armored battalions; in the armored division six armored and five mechanized infantry battalions; in the airborne division nine parachute and one light armored battalions; and in the air assault division nine airmobile infantry.

By TOE the division commander is a major general. He has two deputy commanders who are brigadier generals. The headquarters and headquarters company numbers approximately 200 personnel; the chief of staff is a colonel.

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*Data about the organization, personnel strength and number of primary weapons in the divisions will be published in the following issues of the journal (ed.).

All divisions provide for brigade commander positions (colonels). The brigade commanders have their own headquarters, numbering 10-12 personnel, but have no permanent combat sub-units assigned. Brigades are formed for the period of battle or for exercises. Their composition may include 2-5 combat battalions of various types, an artillery battalion, and combat and service support sub-units.

At the start of the 1980's, with the advent of the Reagan Administration, the aggressiveness of American imperialism increased sharply and set as its goal the achievement of military superiority over the USSR and the defense of U.S. "vital interests" in various parts of the world. The strategy of "direct confrontation" with the Soviet Union, which has become the basis of current U.S. military doctrine and calls for active training of the armed forces for war, serves to confirm the militaristic strivings of the U.S. military and political leadership. The result was the 1981 adoption of the broadest Army reorganization program of the past 20 years--"Army-90."

According to the Western press, this program proposes reexamining the TOE organizational structures of all large-units and units during this decade and simultaneously equipping them with modern weapons and combat equipment. It is emphasized that durir first stage (through the mid-80's) it is planned to shift to a new orga. .ation and rearm mechanized and armored divisions (this part of the program received the name "Division-86"), and by 1990 to complete the reorganization of infantry, airborne and air assault divisions, and corps subordinate units and sub-units. It is proposed, for example, that a mechanized division have three brigade headquarters; five armored and five mechanized infantry battalions; five artillery battalions (203.2 mm and 155 mm self-propelled howitzers; RS30 Multiple Launch Rocket Systems (MLRS)); an air defense battalion (DIVAD self-propelled anti-aircraft artillery gun, Improved Chaparral anti-aircraft missile system, and Stinger mobile anti-aircraft missile system); an army aviation brigade; and combat and service support units and sub-units.

It preserves the basic structure of the existing division organization: a division base and combat battalions. It is planned to have six armored and four mechanized infantry battalions in the armored division.

Foreign press reports on the organization of future mechanized and armored divisions indicate that practically all sub-units in these divisions may undergo substantial changes. Thus, it is planned that armored battalions (580 personnel and 58 M1 Abrams tanks) will have 5 companies--a headquarters company and 4 tank companies (each with 3 platoons of 4 tanks; 14 total tanks). It is planned to have six companies in mechanized infantry battalions: headquarters company, four mechanized infantry companies (each with three mechanized infantry platoons of three mechanized infantry squads) and an anti-tank company (three anti-tank platoons with four M901 PTRK [anti-tank rocket systems?]).

The artillery observation battery in the artillery battalion is to be replaced by an artillery observation battalion. It would receive improved

field artillery radar sets, moving ground target indicator radar sets, sound ranging stations, reconnaissance drones and remote transmitters. The battalion of 203.2 mm self-propelled howitzers will be reorganized as a composite battalion to include one battery of RS30 MLRS (nine launchers) and two batteries of 203.2 mm self-propelled howitzers (having eight guns each instead of four). The number of 155 mm self-propelled howitzer battalions (three) will remain unchanged, but the number of guns in each battery will increase from six to eight. Under the new organization the mechanized and armored divisions will have a total of 16 203.2 mm and 72 155mm self-propelled howitzers and 9 RS30 MLRS.

The entire helicopter complement of the future divisions will be combined into an army aviation brigade which will have 146 helicopters of various types, including 50 armed with the new Hellfire ATGM systems.

During development of the new division organizations a great deal of attention is being paid to equipment for the intelligence and electronic warfare and engineer battalions, and the NBC defense company, as well as to equipment for automating command and control of sub-units and weapons on the battlefield, data collection and processing, and the work of rear services elements. To increase the capabilities of the rear services organization under combat conditions it is planned to form three brigade rear services support battalions, each having four companies: headquarters, supply, repair and medical.

According to American specialists, the large units, units and sub-units of the new organization should become more universal and have significantly greater fire and striking power, mobility, anti-tank and anti-air capabilities, and be able to conduct highly effective combat operations using conventional weapons and weapons of mass destruction, under conditions of electronic countermeasures in various theaters of military operations.

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WEST GERMAN ENGINEER TROOPS OF GROUND FORCES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 83 (signed to press 19 Jul 83) pp 35-39

[Article by Col V. Petrov]

[Text] The Bundeswehr command is implementing numerous measures to improve combat readiness as part of continuing efforts to increase the firepower and striking power of its ground forces and prepare them to participate within NATO in an aggressive war against the Soviet Union and the other socialist states. These measures include further developing engineer forces and weapons. Specialists indicate that engineers support combat operations of primary ground forces branches and activities of rear services elements, and limit enemy operations through engineering activities which impede his accomplishment of combat missions.

According to the foreign military press, engineer forces include sub-units organic to army corps, divisions, brigades and territorial forces formations. It is noted that in contrast to the armies of some other NATO countries, it is not envisioned that ground forces will have centralized engineer units and sub-units. It is also emphasized that as a result of recent reorganization the distinction between light and heavy engineer sub-units has been abolished. The separate special barrier platoon of the army corps has also been disbanded. Its functions will be fulfilled by one of the companies of the corps engineer battalions.

In the army corps the tasks of engineer support to combat operations are assigned to the chief of engineer forces. Engineer, amphibious engineer and pontoon battalions are subordinate to him.

Engineer battalions (up to 800 personnel each) are designed to accomplish the most difficult and arduous tasks of engineer support to corps combat operations, especially in road construction and maintenance, mine laying and explosives work, construction and overcoming barriers and obstructions, etc. In individual cases some of these sub-units may be attached to divisions to strengthen their engineer forces and equipment. Depending on their mission, these battalions may be equipped with combat engineer ammunition, bulldozers, road graders, assault crossing equipment, special purpose construction machinery and other equipment.

The amphibious engineer battalion (more than 700 personnel) primarily supports assault crossing of water obstacles and preparing and maintaining crossing sites. Its equipment includes M2 self-propelled pontoon parks capable of laying a 450 m floating bridge, bulldozers, trucks, etc.

Pontoon battalions (more than 700 personnel each) are equipped with "Khol'platten," pontoon parks which provide for laying 300 m long floating bridges or organizing the crossing of combat equipment on pontoon ferries.

The foreign press notes that most engineer sub-units of army corps are held at reduced TOE strength to economize equipment. It is also reported that it has been proposed to have an engineer brigade (called an engineer command in the FRG) in each army corps organized from existing sub-units. This unit would be commanded by the corps chief of engineer forces. In addition to engineer support of combat operations, it is planned that he would be responsible for conducting chemical and radiological reconnaissance and accomplishing protective measures against weapons of mass destruction (OMP) [nuclear, biological and chemical weapons--NBC]. For this purpose it is considered advisable to transfer the NBC defense battalions to the engineer command. It is proposed that the sub-units of these battalions be used for special work, but in individual cases some may be included in missions of engineer support to combat operations.

Divisions (excluding airborne divisions) and their subordinate brigades are supported by engineer battalions and companies respectively. Their organization, armaments and capabilities will be examined below.

Like the ground forces, the territorial forces have a relatively large number of varied engineer sub-units. These are primarily battalions and companies designed, according to foreign press reports, to accomplish engineer work and equip and maintain crossing sites on behalf of both West German and allied NATO ground forces large units. In addition to these units, small engineer sub-units consisting of highly qualified specialists on construction of fortifications and barriers, called wahlmeisters, have been formed within the territorial forces at the regional and district levels.

This in general is the structure of Bundeswehr ground forces engineer troops. Below the mission, organization, armament and capabilities of the division engineer battalion and the brigade engineer company are examined in more detail.

The engineer battalion is a TOE sub-unit in the motorized infantry division, tank division, and mountain infantry division. It is designed to support combat operations and accomplish the most difficult engineer work. Its tasks include conducting engineer reconnaissance, constructing mixed minefields and other barriers, clearing mines from areas and objectives, making passages in minefields, obstacles and zones of destruction, constructing and repairing roads and road works, laying cross-country roads, preparing and maintaining water obstacle crossing sites, carrying out troop camouflage measures, rendering technical assistance to troops in fortifying positions,

supplying the troops with water and engineer items, performing first line repair of engineer equipment and property, etc. The battalion consists of a headquarters, headquarters and supply company, three engineer companies, and an engineer equipment company (Figure 1). It numbers 800 personnel.

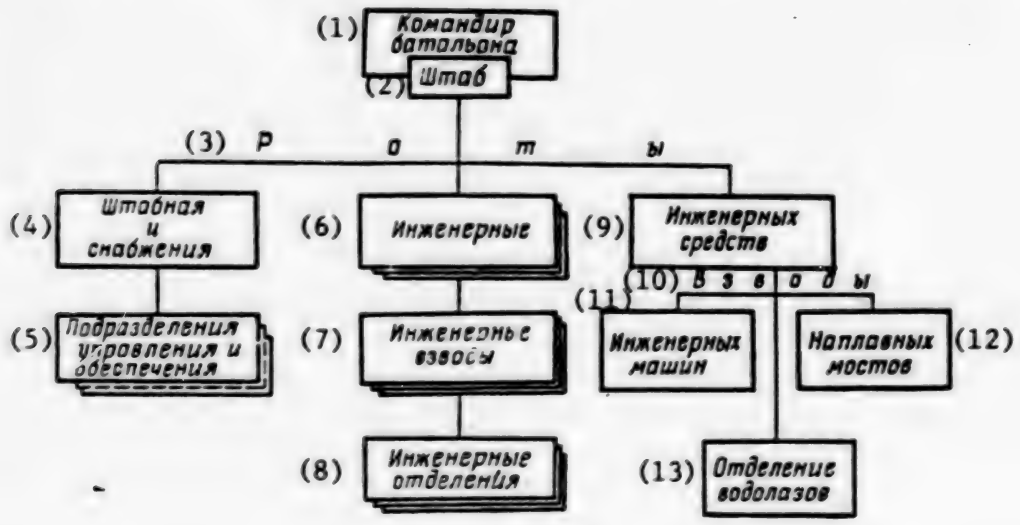

Figure 1. Organization of the engineer battalion of an infantry (tank, mountain infantry) division.

Key:

1. Battalion Commander
2. Headquarters
3. Companies
4. Headquarters & Supply Co
5. Control & Support Sub-Units
6. Engineer Companies
7. Engineer Platoons
8. Engineer Squads
9. Engineer Equipment Co
10. Platoons
11. Engineer Vehicle Plt
12. Floating Bridge Plt
13. Diver Squad

The engineer battalion headquarters includes the battalion commander (he is the division engineer), the chief of staff and several officers in charge of combat training, intelligence, communications, etc.

The headquarters and supply company has the mission of organizing supply and medical support and providing the battalion all types of pay and allowances. It includes the division engineer group, company and battalion headquarters, and the following sub-units: headquarters support, communications, ammunition delivery, transport, rations, fuels and lubricants (POL), clothing supply, sanitation and repair. The company is equipped with motorcycles, trucks of various sizes and types, communications equipment, two command and reconnaissance vehicles based on the TPzl "Fuchs" armored personnel carrier [APC], two vehicle mounted cranes and two repair workshops based on the "Unimog" 1.5 ton truck.

The engineer company numbers more than 130 personnel. Its main sub-units are three engineer platoons (35 personnel each), each consisting of a headquarters squad and three engineer squads. Squad personnel with their weapons and TOE equipment are transported on a specially equipped 5 ton truck. In addition, the company has two 60 horsepower tracked bulldozers and two 12 ton trucks with self-loading platforms for their transport, three 1.5 ton special "Unimog" trucks for transporting power tool sets, one 7 ton cargo truck, and also several trucks for delivery of the TOE load of mines.

The engineer equipment company numbers approximately 180 personnel and consists of a headquarters squad (11 personnel), an engineer vehicle platoon (62), a floating bridge platoon (100) and a diver squad (6).

The engineer equipment platoon (headquarters and six squads) has three 60 horsepower tracked bulldozers and three 12 ton trucks with platforms for their transport, two 160 horsepower tracked bulldozers and two 25 ton low bed semi-trailers with prime movers for their transport, two general-purpose loaders, two road graders, two vehicle mounted cranes, an engineer instrument set transportable on a special "Unimog" 5 ton truck, two mobile compressors, three 7.5/15 kilohertz power generators, three 12 ton prime movers with 25 ton capacity low bed semi-trailers for transporting six bridge structures for the tank bridgelayers, seven 7 ton dump trucks, and welding and other equipment.

The floating bridge platoon consists of a headquarters, two bridge squads and one crossing squad. Its equipment includes an FSB pontoon park, aluminum foot bridge set and flexible track set, 20 assault boats, 12 bridge erection boats, and trucks with trailers.

The diver squad has special equipment and machinery to conduct reconnaissance of water obstacles and accomplish underwater work in building crossing sites.

West German military specialists believe that the existing engineer battalion organization and equipment enable it to support the combat operations of division sub-units and units. It is considered advisable to use the battalion in a centralized fashion to accomplish the most arduous engineering work on land and to secure troop crossings over water obstacles. In some circumstances some or all of its sub-units may be attached to the brigades, especially when they are conducting offensive operations.

The foreign military press has reported that engineer battalion capabilities have been tested during exercises conducted by ground forces. In particular it was noted that the organic FSB pontoon park can be used to assemble one floating bridge of 135 m length, two of 75 m, or three of 55 m. Alternately it is possible to lay a 95 m long bridge and prepare one ferry crossing employing two ferries, or two crossings each using one ferry. According to exercise experience, it has taken about 60 minutes to assemble a 100 m bridge and 45 minutes to prepare a ferry crossing. The capacity of the bridge crossing is 200 vehicles per hour during daytime and 120 at night. Laying a foot bridge (for single file column movements) 144 m in length, supporting

a simultaneous assault crossing by 20 infantry squads, and reinforcing 50 m of river bottom with 4.2 m wide flooring at the place of fording or the banks of the water obstacle takes care of the rest of the battalion. The battalion's road building equipment (road graders, general purpose lift trucks, bulldozers and dump trucks) working 10 hours per day can repair a completely destroyed section of road approximately 2 km in length and also keep the division's main routes in working order.

According to the foreign military press, the engineer company* is the primary sub-unit intended for direct engineer support of combat operations by brigade sub-units (motorized infantry, tank, airborne and mountain infantry brigades). It numbers approximately 200 personnel and includes a headquarters squad, three engineer platoons (according to the press it is planned to have two such platoons in the future which will have more modern equipment), a bridgelaying platoon, an engineer platoon and a support squad (Figure 2).

The headquarters squad includes the company commander (the brigade engineer) and several drivers and specialists. It contains two TPz1 "Fuchs" APCs, motorcycles, trucks of varying capacities, a mobile generator, communications gear and other equipment.

The engineer platoon (approximately 35 personnel) includes a headquarters and three engineer squads, each of which is transported along with its weapons, equipment and TOE property, including explosive charges and mines, on a specially equipped TPz1 APC.

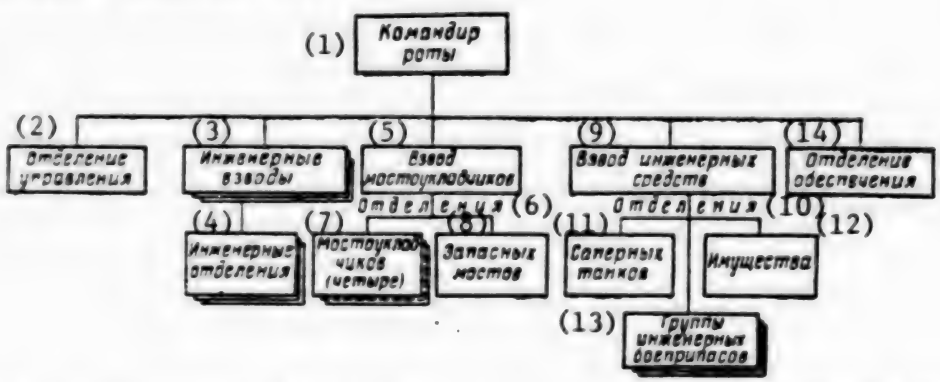

Figure 2. Organization of the engineer company of a motorized infantry (tank, airborne, mountain infantry) brigade.

Key:

1. Company Commander
2. Headquarters Squad
3. Engineer Platoons
4. Engineer Squads
5. Bridgelaying Platoon
6. Squads
7. Bridgelaying Squads (4)
8. Spare Bridge Squad
9. Engineer Equipment Platoon
10. Squads
11. Engineer Tanks Squad
12. Equipment Squad
13. Engineer Munitions Groups
14. Support Squad

*In foreign publications it is called an armored engineer company. (ed.)

The bridgelaying platoon consists of a headquarters, four bridgelaying squads, and a spare bridge squad (single-span construction transported on a low bed semi-trailer with prime mover).

The engineer equipment platoon (30 personnel) has a headquarters, an engineer tanks squad (two "Pioneerpanzer-1" vehicles), an equipment squad (three 1.5 ton special "Unimog" trucks for transporting power tool sets, eight 10 seat inflatable and powered assault boats, trucks, trailers, etc.) and three engineer munitions groups (each with one 7 ton truck with mines).

The support squad consists of a maintenance group, POL group, repair group, provisions group and medical group.

The ground forces command considers it advisable to use the brigade engineer companies in both a centralized manner (for accomplishing the most arduous work) and a decentralized manner (for direct engineer support of brigade sub-units). Foreign press reports indicate that the engineer company can conduct engineer reconnaissance for the brigade, construct and overcome minefields, prepare positions for personnel and combat equipment, and accomplish a number of other missions.

The TOE equipment of the company enables it to erect five bridges over obstacles up to 20 m in width, lay cross-country roads for two battalions at a rate of 4-6 km per hour, prepare the banks and bottom of water obstacles for deep fording by tanks and armored fighting vehicles, destroy road surfaces, fords and sections of cross-country roads, provide for water obstacle crossings by 15 infantry squads simultaneously, and establish antitank minefields during the course of battle using armored personnel carriers. It can also carry out first line repair of its TOE engineer equipment.

Personnel training for engineer troops takes place in units and in military and civilian educational institutions. According to the West German press, training and retraining of command cadres and a significant portion of the junior military specialists is accomplished at the engineer school in Munich. It conducts annual gatherings of engineer company and battalion commanders and seminars for the command cadres of engineer sub-units of NATO Combined Armed Forces in the Central European Theater of Military Operations. It also conducts special training of tank and motorized infantry platoon and company commanders.

The West German command believes that the existing organization, weapons and equipment of ground forces engineer sub-units enables them to accomplish missions of providing engineer support to combat operations of sub-units, units and large units under various conditions of modern warfare.

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PERCEPTIONS, VIEWS, COMMENTS

NEW ANTITANK, ANTIPERSONNEL MINES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 83 (signed to press 19 Jul 83) pp 41-46

[Article by Col N. Zhukov]

[Text] During recent years the capitalist countries have developed new models of mines, most of which are antitank mines. Mechanized emplacement equipment is also being developed. According to the foreign press, tests of a number of remote mine laying systems (including highly effective anti-tank and anti-personnel mines) have now been concluded and their series production begun. Thus, since 1981 the U. S. has been producing the GEMSS ground emplaced mining system which uses anti-tank and anti-personnel mines. Manufacture of 155 mm artillery cluster munitions filled with anti-tank and anti-personnel mines is continuing. Remote mine laying will also be possible using the new U. S. multiple launch rocket system (MLRS) which the ground forces of the FRG, Great Britain, France and Italy also plan to adopt. The FRG is using the Light Artillery Rocket System (LARS) and the MSM ground based remote mining system to lay anti-tank minefields.

At the same time, mines currently in foreign inventories (primarily anti-tank mines) are being improved to increase their effectiveness and resistance to enemy attempts to overcome mined areas. This is being achieved primarily through the use of more modern fuses and anti-lift devices. According to the foreign press, foreign armies still have significant numbers of mines developed in the 1950's which no longer satisfy modern requirements. These include, for example, track cutting mines with impact fuses and rather powerful explosive charges (7-8 kg). Equipping such mines with a fuse that facilitates the ammunition's action against the entire undercarriage of the tank; that is, turning them from track cutting to belly attack mines is considered to be the most useful way to improve them. The use of mechanical rod-type, pneumatic tube-type, and electronic proximity fuses is planned for this purpose.

British specialists have developed two fuses for the extended L9A1 mine: the XL127A2 mechanical rod-type and the XL128A2 electronic proximity (Figure 1). The latter is affixed to the outside of the body of the mine and actuates when under the bottom of a moving tank. Its electronic circuit includes an anti-lift device which explodes the mine upon attempts to remove it from its position. Its power supply is a lithium-cupric oxide electro-chemical element, which enables the fuse to operate constantly for six months.

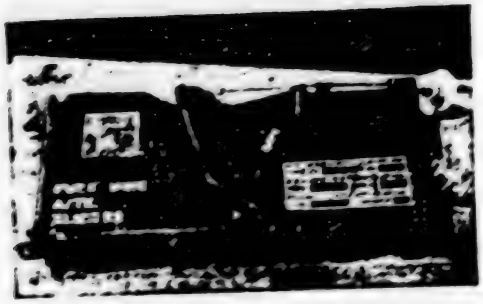

Рис. 1. Английский электронный взрыватель XL128A2

Figure 1. British XL128A2 Electronic Fuse

France has also developed new anti-tank mine fuses. Equipping the Model 1952 track cutting mine with a mechanical rod-type fuse permits it to be used as a belly attack mine. Another model (hose-type fuse) has a cylindrical body containing a device to switch it from safety to combat position and back, and four three-meter long cross-shaped hoses affixed. These hoses are emplaced in the ground when the mine is set up. They are activated when a moving target simultaneously passes over two opposite segments; i. e., when a tank is over the mine.

There is also an electronic proximity fuse which activates only from the simultaneous influences of the seismic and magnetic fields of a moving wheeled or tracked armored vehicle. Characteristic of this fuse is the presence of a self-destruction device which explodes the mine at a set time after its activation.

Another direction in which fuses are being improved is through creation of models which make it as difficult as possible for the enemy to disarm minefields and which simplify their crossing by friendly forces. For example, Italy has already developed and tested two variants of universal type electronic fuses designed for use with most existing track cutting mines without modification. It is noted that they are highly resistant to impact and to the action of explosive minesweeping. The TS/E fuse is also equipped with an electronic device for remotely switching it from combat to safety position and back. This is necessary so that one's own tanks can cross the minefield.

According to foreign press reports, development of new models of mines is underway in almost all developed capitalist states. Primary efforts of Western specialists are directed at improving anti-tank mines, most importantly belly attack and anti-side armor mines. At the same time, some countries are also continuing to develop track cutting mines. Individual firms are conducting these efforts on their own initiative. For example, such types of ammunition

have been developed in Italy, Belgium and Sweden. The tactical and technical specifications of new anti-tank mines are given in Table 1.

New European models of track cutting mines have been introduced. The French LXT-542 mine (Figure 2A) is capable, according to the foreign press, of a mobility kill on any tracked or wheeled combat vehicle. It is contained in a prismatic plastic body with a pressure plate on top and a directional charge. The mine is designed for a mechanized minelayer and is equipped with a safety device which retards for 15 minutes the final arming of the ammunition after its emplacement.

The Italian TCE-3.6 and TCE-6 mines (Figure 2B) are identical, differing only in the weight of the explosive charge and the height of the body. The body is plastic with reinforcing ribs. The second model is equipped with a fuse having an electronic device for remotely switching it from combat to safety position and back. The mines are emplaced in the ground.

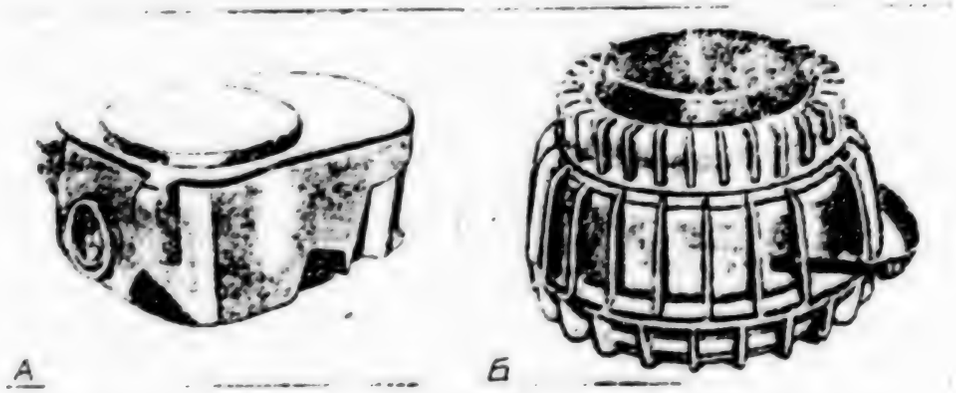

Рис. 2. Противогусеничные мины: А — LXT-542 (Франция); Б — TCE 6 (Италия)

Figure 2. Track Cutting Mines: A -- LXT-542 (French); B -- TCE/6 (Italian)

The SBP-04 and -07 track cutting mines (also of Italian manufacture) are designed to be emplaced by hand, and differ in the weight of the explosive charge and the dimensions. They are made of a plastic body with a pressure plate on top. These mines have three types of charges, one of which, in addition to an anti-lift device, is equipped with a self-destruction device, adjustable in terms of the period of time that the munition is in combat position. The Belgian PRB-408 mine is a set of nine standard PRB-416 demolition slabs, housed in a slender, prismatic polyethelene body. The body has a wide neck on which is located a round pressure plate (similar to the plate of the M3 mine) and a PRB-430 high explosive anti-personnel mine which serves as an explosive device with an auxiliary detonator. The PRB-408, which is hand

Table 1

Primary Tactical and Technical Characteristics of Antitank Mines

Model (Country)	Casing Material	Weight(kg) Overall / Explosive	Dimensions(mm) Diameter / Height	Fuse
Anti-Track				
LXT-542 (France)	Plastic	6.4 / 4.7	280 X 190 / 105	Mechanical
TCE/3.6 (Italy)	" "	6.8 / 3.6	270 / 145	Electronic
TCE/6 (Italy)	" "	9.6 / 6	270 / 185	" "
SBP-04 (Italy)	" "	5 / 4	250 / 110	" "
SBP-07 (Italy)	" "	8.2 / 7	300 / 130	" "
PRB-408 (Belgium)	" "	4.1 / 3	-	Mechanical
Bottom Attack				
PzAbwVMi-3 (FRG)	Plastic	-	-	Magnetic Proximit
Scatterable (France)	Metal	2.4 / 0.7	139 / -	" "
Type 6 (Sweden)	Plastic	7.5 / 3.5	250 / 110	" "
Anti-Side Armor				
SMI 22/6 (Austria)	Metal	10 / 6	180 / 280 (length)	Electromechanical or Wire Guided

emplaced in the ground, activates through pressure on its pressure plate, which when depressed in turn activates the anti-personnel mine. When the latter explodes it triggers the primary anti-tank mine charge.

Belly attack mines are designed predominantly for mechanized emplacement. As a rule they have a directional charge.

The West German PzAbwVMI-3 mine which is under development is the new engineer munition of the Bundeswehr. It will become an integral part of the MIVS-85 ground based mining system, which includes a mine-laying trailer with which new mines will be emplaced at a speed of 300 mines per hour. According to the foreign press, this mine must function under the entire undercarriage of the tank, be simple to emplace and easy to camouflage, and include a self-disarming device which automatically switches it to a safety position after it has been emplaced for a given period of time. This will permit the mines to be picked up by friendly forces for repeated use.

A French scatterable mine is also under development. It consists of a metallic cylindrical lower body with sides reinforced by spring-loaded arms through which the munition is stabilized on the ground after it lands. The body has a small directional charge and electronic magnetic fuse which activates the mine either under the tracks or under the bottom of a moving target. The fuse initiates the mine's explosive charge only if a vehicle weighing more than 1.5 tons passes over it. Its electrical circuit includes a self destruction device which explodes the ammunition after a given period of time.

Such mines will be delivered by a new piece of equipment, the EBG armored engineer vehicle, which is equipped with a five tube mine laying apparatus mounted in a revolving turret. Each tube contains five mines which are fired to a distance of 250 meters with the aid of pyrotechnic cartridges. After they fall to earth they are stabilized and switched to combat position. Reportedly this mine can penetrate 50 mm of armor from a distance of 0.5 meters.

The Swedish Type 6 mine entered series production at the beginning of this year. It is designed for mechanized delivery with the aid of a specially developed mine laying trailer. The mine has a directional charge and a magnetic proximity fuse. It is noted that when it is activated under a tank tread its action is close to that of an ordinary track cutting mine, but when it explodes under a tank bottom it penetrates, causing a high armored effect and increasing the pressure inside the tank to 3-5 atmospheres. According to foreign press reports, tests indicated that an explosion of this mine completely puts a tank out of commission. Using these new Swedish mines in barriers permits reducing the overall requirement for munitions without reducing their effectiveness. For a 1,000 m^2 mine field, instead of 1,000 ordinary track cutting mines (weighing 10 kg each), 400 Type 6 mines (7.5 kg) are sufficient. This means that the overall weight of munitions requiring transport is reduced from 10 to 3 tons, and the time required for 30 men to emplace them is reduced from 3.5 to 1.5 hours.

Anti side-armor mines are viewed by foreign specialists as supplemental to other types of mines.

The West German PzAbwRMI mine is being developed on order from the Bundeswehr engineer forces. It is designed for constructing minefields on roads, primarily autobahns, and for overlapping coverage of narrow sectors, gaps and passages in other barriers. According to Bundeswehr military experts, such munitions will also be highly effective used against tank mine clearers. Development of this mine is being carried out jointly with French specialists.

The Austrian SMI 22/6 mine (Figure 3) is designed to be used in built-up areas and on highways. It has support mounts on which a cylindrical body with the explosive charge is affixed horizontally and oriented in the probable direction of the target's movement. The mine may be remotely wire activated by a concealed observer, or with the aid of an electrically operated fuse connected to a thin wire lead which is set in the path of enemy tank movement. The directional charge penetrates 60 mm thickness of armor at a distance of up to 50 m.

Anti-personnel mines (high explosive and fragmentation -- Table 2) are used to destroy enemy personnel. They are set in anti-personnel minefields, but are most frequently used in combination with anti-tank mines.

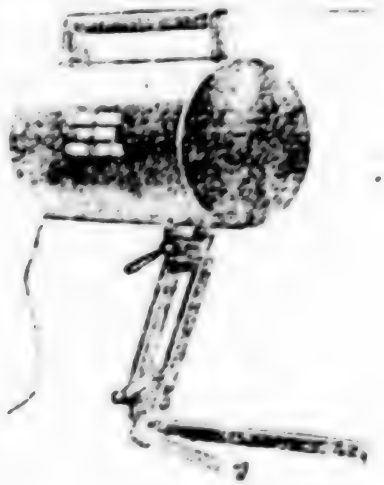

Рис. 3. Австрийская противобортовая мина SMI 22 6

Figure 3. Austrian SMI 22/6 Anti-Side Armor Mine

High explosive anti-personnel mines have been most widely developed in the Italian army.

The Italian Mk2 mine (Figure 4A) is a small, non-metallic mine designed to be scattered by helicopter or ground based equipment. Laying by hand is also possible. The mine has a flat body and functions regardless of whether the pressure plate is on the top or bottom. There are two variants, differing in their fuses. One is equipped with an anti-lift device which explodes the mine when removal is attempted.

Table 2

Primary Tactical and Technical Characteristics of Antipersonnel Mines

Model (Country)	Casing Material	Weight(kg) Overall / Explosive	Dimensions(mm) Diameter / Height	Fuse
High Explosive				
Mk2 (Italy)	Plastic	0.135 / 0.033	90 / 32	Mechanical
TS-50 (Italy)	" "	0.186 / 0.05	90 / 45	Pneumatic
VAR/40 (Italy)	" "	0.105 / 0.04	78 / 45	Mechanical
VAR/100 (Italy)	" "	0.170 / 0.1	78 / 57	" "
PRB-M409 (Belgium)	" "	0.183 / 0.08	82 / 28	" "
Fragmentation				
P-25 (Italy)	Plastic	0.63 / 0.14	80 / 180	Mechanical
P-40 (Italy)	" "	1.5 / 0.25	90 / 120	" "
PRB-413 (Belgium)	Steel	1.1 / 0.1	46 / 230	" "
SpM75 (Austria)	Steel	6 / 0.5	125 / 160	" "
APGES (Austria)	Plastic	5.8 / 2	320 x 75 / 130	Electrical or Mechanical
SMI 21/2 (Austria)	" "	7.5 / 3.5	315 x 80 / 160	" "

The Italian TS-50 mine (Figure 4B) is contained in an air tight plastic body. It is emplaced by hand to a depth of up to 30 mm or is scattered with the aid of the DAT helicopter mine laying system. It functions when approximately 12 kg of force is applied to the pressure plate.

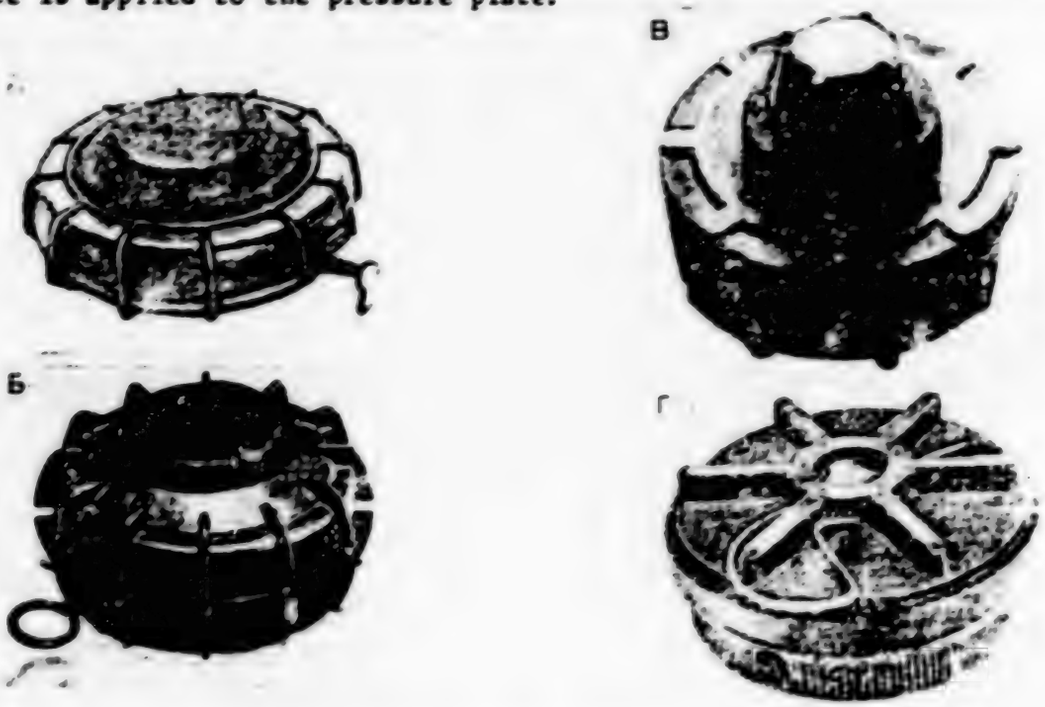

Figure 4. High explosive Anti-Personnel Mines: A -- Mk2 (Italy); B -- TS-50 (Italy); V -- VAR/100 (Italy); G -- PRB-M409 (Belgium)

The Italian VAR/40 and VAR/100 mines (Figure 4V) differ only in the weight of the explosive charge and the height of the cylindrical plastic body. They have a mechanical fuse with a pressure plate activator which protrudes above the surface of the ground after the mine is laid. It has been reported that due to their small size these mines may be used as sabotage devices. In addition to causing personnel casualties they can damage light vehicles.

The Belgian PRB M409 mine (Figure 4G), which is found in the armament of a number of armies, has a short plastic body which permits it to be scatter delivered. It has a mechanical fuse with a dual striker mechanism and an elastic membrane activator located in the body. It has a safety cap fastened to a cam in the center of the membrane by a cotter pin. The mine explodes from pressure on the membrane which breaks and activates the fuse striker mechanism.

Anti personnel fragmentation mines are rather widespread in foreign armies. There are stationary, bounding and directional charge models.

The Italian P-25 mine (Figure 5A) has a plastic cylindrical body in which a trip wire type mechanical fuse is placed. Usually two 15 m long trip wires are connected to the fuse activator. As a rule the mine is fastened to objects a

short distance above the ground and explodes when one of its trip wires is touched. Its effective range against personnel is 15 m.

The Italian P40 mine (Figure 5B) is a bounding mine. It also has a plastic body which is a propelling cannister for the fragmentation element, and it has

Рис. 5. Противопехотные осколочные мины: А — Р-25 (Италия); Б — Р-40 (Италия); В — PRB-413 (Бельгия); Г — SpM75 (Австрия)

Figure 5. Anti-Personnel Fragmentation Mines: A -- P-25 (Italy); B -- P-40 (Italy); V -- PRB-413 (Belgium); G -- SpM75 (Austria)

the same trip wire type fuse as the model discussed above. Usually the mine is set in the ground at a depth so that only the fuse pin with the two 15 m trip wires remain on the surface. When someone touches one of the wires the fragmentation element is ejected to a given height and explodes. According to the Western press the mine inflicts casualties to at lest 50% of the personnel located within 15 m. The Belgian PRB-413 mine (Figure 5V) includes a fragmentation element, the walls of which are made from a coiled steel wire with hatches inside its explosive charge, and a trip wire type fuse. The mine is set up by being fastened to a standard prop above the surface of the ground. One or two trip wires are affixed to each of four pull rings. The mine explodes when one of them is touched. The body of the mine is shattered from the explosion and forms up to 600 fragments which inflict personnel casualties to a distance of 14 m.

The Austrian SpM75 mine (Figure 5G) is a bounding mine. It consists of a body, an explosive element and a fuse. The body has a base plate and a propelling fuse. The explosive element contains 4,600 steel balls and its internal chamber is filled with explosives. The mine has a mechanical trip wire type fuse. Its actuator is a revolving T-joint with loops for fastening three trip wires, and an electric fuse which is used for remote wire detonation. The mine is set in the earth and explodes when one of the wires is touched. The explosive element is ejected to a height of 1.5 m and explodes causing personnel casualties in a radius of 20 m.

The Austrian directional mine, created by the same APGES Company which made the previously discussed model, has a prismatic body which contains an explosive charge and 2,500 steel balls having a diameter of 5-8 mm (lethal up to 100 m). It has a trip wire type fuse. In addition it can be wire detonated from a concealed location.

The Austrian SMI 21/2 mine (also directional) is designed to destroy widely dispersed personnel and unarmored equipment such as aircraft and helicopters. Reportedly setting up such mines ahead of time is very useful for protecting operational airfields from sudden enemy helicopter assault. The mine has a prismatic body with an explosive charge and a plastic mold into which fragments are poured. It is set above ground and is activated by a trip wire fuse or electrically by remote control. A cluster of fragments is formed upon explosion which can cause personnel casualties in a 75 degree sector to a distance of 80 m.

9069
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U. S. AIR FORCE AEROSPACE DEFENSE COMMAND

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 83 (signed to press 19 Jul 83) pp 47-51

[Article by COL I. IGNAT'YEV]

[Text] The Pentagon directed the unrestrained arms race of recent years primarily toward development of strategic offensive systems. Huge sums were allotted each year for development and deployment of the latest ICBMs, nuclear powered missile submarines, strategic bombers and cruise missiles. As a result, a substantial gap formed between U. S. strategic offensive and defensive capabilities according to U. S. military specialists. The military-industrial corporations immediately seized upon the thesis of the rupture of the balance between offensive and defensive aerospace weapons, seeing in it a new source of excess profits. Numerous declarations by officials followed concerning the vulnerability of U. S. armed forces and "overall U. S. defenselessness." Thus the usual propaganda technique was used to justify new orders for costly strategic defensive systems. Along with this, organizational measures were undertaken. One of these was the reorganization of the U. S. Air Force Aerospace Defense Command (ADC).

ADC is the highest operational formation of U. S. strategic defensive forces. Organizationally it is a part of the Combined United States-Canadian North American Aerospace Defense Command (NORAD).* Before 1979 ADC, like two other Air Force commands, the Strategic Air Command (SAC) and the Military Airlift Command (MAC), was simultaneously an administrative (basic) and an operational (special) formation. Administrative functions usually include the following: manning and training large units, units and sub-units; equipping the forces with weapons and combat equipment; logistics support; pay; etc. Operational functions include direct tactical control in peacetime and wartime. The dual status of these commands stems from the fact that their forces and equipment are intended to solve major strategic tasks: defense of the North American continent from aerospace attack; conducting nuclear missile strikes; and accomplishing strategic airlift. Their sub-units and units are constantly operationally subordinate to their headquarters, and as a rule are not in the U. S. Armed Forces combined zonal commands.

*Before 12 May 1981 it was called the Combined North American Continental Air Defense Command. (ed.)

In 1977 Congress proposed that the Department of Defense examine the question of transferring the forces and equipment of aerospace defense to other major U. S. Air Force commands, preserving for ADC only the functions of operational control. The proposal was adopted. However a number of high military officials opposed it, fearing that such a division of functions would negatively affect the state of combat readiness of the aerospace defense forces. General D. James, commander of the Aerospace Defense Command (ADC) and NORAD*, was relieved of his post and retired under a suitable pretext for his active opposition to this reorganization. In demonstration, Brig Gen R. Berg, NORAD deputy chief of staff for intelligence, and Maj Gen R. Barber, NORAD deputy chief of staff for plans and programs, left their posts. The next NORAD commander, Gen D. Hill, followed the order, accomplished a significant portion of the measures for reorganizing ADC, and then retired.

The reorganization was conducted between October 1979 and March 1981. According to the foreign press SAC gained the nuclear missile warning and space control systems (3,800 personnel, 35 facilities), the Tactical Air Command (TAC) gained the air defense forces and equipment (almost 22,500 personnel, more than 100 facilities), and the U. S. Air Force Communications Command gained the ADC communications sub-units and units (up to 1,800 personnel, approximately 70 facilities). The transferred formations were organizationally included in the large units and units of these three commands in the area in which they were located. Moreover, the positions of deputy chief of staff for these matters were given to SAC and TAC.

To provide administrative control over the transferred forces and facilities, 190 personnel were moved from ADC Headquarters to SAC Headquarters (Offutt Air Force Base), 400 to TAC Headquarters (Langley Air Force Base) and 25 to the Communications Command Headquarters (Scott Air Force Base). As a result of the reorganization the numerical strength of headquarters sub-units of the ADC was reduced by 1,360 personnel. In view of the significant reduction in functional responsibilities of the ADC commander, the position was initially downgraded one level from full general to lieutenant general, but was restored in 1981.

According to American press reports, the reorganization of the U. S. Air Force ADC supposedly stemmed from operational requirements. Thus, Secretary of the Air Force D. Stetson, elaborating on the plan, wrote: "The reorganization reflects the course, results and tendencies of equipment development, and the strategy and principles of distribution of Air Force resources. It in no way reduces the role of aerospace defense of the North American continent...The reorganization frees the NORAD Commander from daily trivial division of his resources and enables him to concentrate his attention on the main questions of the combat use of aerospace forces and on allied and international aspects of the activity of the combined command, including the problems of detecting, warning and assessing the nature of an enemy nuclear missile strike as well as the role of aerospace defense in modern warfare."

*By agreement with Canada the commander of U. S. Air Force ADC is simultaneously NORAD Commander, and accordingly ADC Headquarters is an integral part of NORAD Headquarters. (ed.)

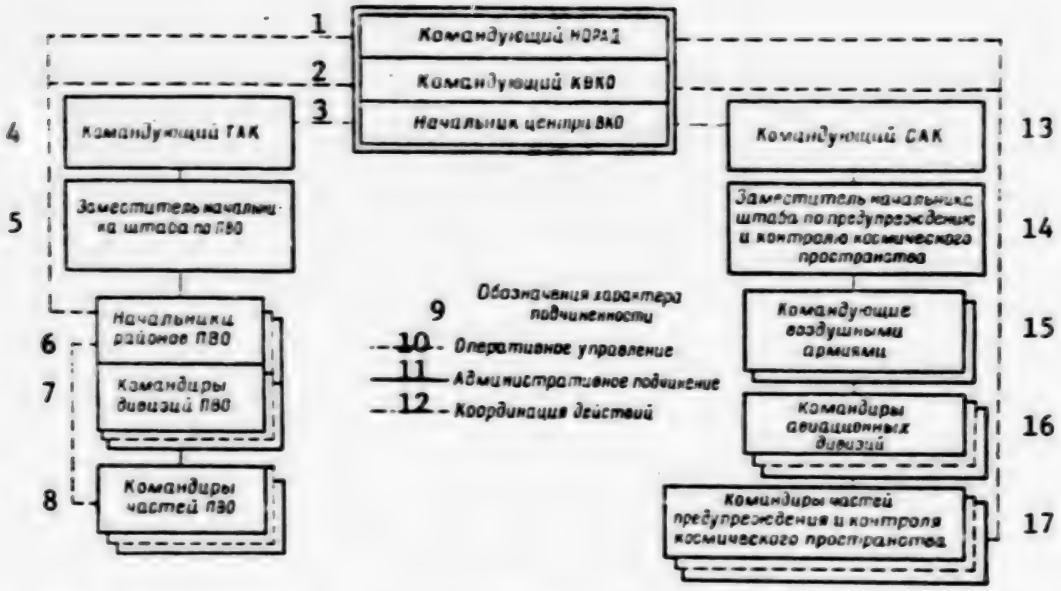

Рис. 1. Организационная структура и подчиненность сил воздушно-космической обороны США

(Figure 1). Organizational structure and subordination of U. S. Aerospace Defense Forces

KEY

1 -- NORAD Commander

2 -- Air Defense Command Commander

3 -- Chief, Air Defence Center

4 -- TAC Commander

5 -- Deputy Chief of Staff for Air Defense

6 -- Chiefs of Air Defense Regions

7 -- Commanders of Air Defense Divisions

8 -- Commanders of Air Defense Units

9 -- Designation of Type Subordination

10 -- Operational Control

11 -- Administrative Subordination

12 -- Coordination

13 -- SAC Commander

14 -- Deputy Chief of Staff for Warning and Space Control

15 -- Commanders of Air Armies

16 -- Commanders of Air Divisions

17 -- Commanders of Warning and Space Control Units

According to the Western press, the reorganization was carried out to increase the command and control flexibility of forces and equipment, to insure close coordination of plans for developing and using various Air Force components in the interests of strategic defense, and also to more effectively distribute multi-purpose weapons systems.

Considering the existing system for assessing and using data on the aerospace situation, American specialists came to the conclusion that including warning and space control systems in SAC will ensure more effective use of the information received in readying intercontinental ballistic missiles and strategic bombers to conduct sudden nuclear strikes. At the same time, transferring the air defense forces to SAC will enable better utilization of the logistics and training base of the command to support the daily activity of fighter aviation, distant early warning and detection and E-3B (AWACS) control aircraft, and radar posts. It is also justified by the fact that in recent years tactical aviation has already been involved in U. S. air defense missions.

As the foreign press notes, the system of operational control of U. S. strategic defensive forces did not undergo significant changes as a result of the reorganization. ADC as a special command is responsible as before for the organization of the U. S. aerospace defense within the framework of the American-Canadian agreement on NORAD. Control over ADC forces and Canadian air defense groups is accomplished through the combined NORAD Headquarters and Command Post located in Colorado Springs, Colorado.

Within the framework of the new organizational structure (Figure 1), on 1 December 1979 an air defense center numbering approximately 1,600 personnel was formed under central U. S. Air Force subordination to accomplish missions of operational (tactical) aerospace defense command and control. Its chief is the ADC commander. The 22d (North Bay, Canada) and the 1st (Tinker Air Force Base, Oklahoma) detachments are subordinate to this center. The first (approximately 60 personnel) accomplishes operational coordination of American aerospace defense forces with the Canadian Air Force Fighter Air Group,* and the second has the mission of supporting the operational use of distant early warning aircraft and E-3B command and control aircraft of the 552d TAC Air Wing (Tinker Air Force Base) in the interests of NORAD.

The foreign press notes that ADC is presently capable of solving the primary missions of controlling the aerospace environment and repulsing strategic air attacks. Nuclear missile attack warning and space control systems, as well as air defense forces and equipment, are operationally subordinate to ADC.

The nuclear missile strike warning systems -- the space based IMEWS (Integrated Missile Early Warning System) and the ground based BMEWS, PARCS, PAVE PAWS (sometimes called Pave Pose in the press) and 474N -- include space and ground based resources the work of which is based on the use of various physical principles for detecting ballistic missile launch and flight.

*Former name -- Canadian Air Force Air Defense Group

IMEWS consists of three operational earth satellites in stationary orbit (36,000 km altitude) above the waters of the Indian (Eastern system), Atlantic and Pacific (Western system) oceans. These satellites are equipped with infrared apparatuses for detecting ground and sea-based missile launches in the active sector of their flight trajectory. According to Western press data the IMEWS system constantly surveys all possible missile launch areas and can detect missiles 1 to 1.5 minutes after launch. Information from the Western system satellite goes directly to the control center (Denver, Colorado), while that from the Eastern system satellites goes through an intermediate data reception center (Pine Gap, Australia). Launch of new satellites to replace those which have ceased operating is conducted from the Air Force Eastern Missile and Space Center in Florida. Data reception and processing centers are manned by personnel of special space communications squadrons.

Ground based radar systems are designed to detect ballistic missiles in flight trajectory and determine their numbers as well as the areas of launch and impact. BMEWS (Ballistic Missile Early Warning System) includes three radar stations (in Alaska, Greenland and Great Britain) and the PARCS (Perimeter Acquisition Radar Attack Characterization System) has one radar station in North Dakota. Pave Paws has one station on the West Coast (California) and one on the East Coast (Massachusetts); 474N has one radar station in Florida. The locations and zones of coverage of these stations (Figure 2) were selected to provide radar coverage of all primary dangerous axes from the point of view of American military experts. According to the foreign press, the operational range of the radars in these systems varies from 1,000 to 5,000 km. Personnel of separate warning squadrons, groups or detachments operate the ground based radar stations.

The space control system* is designed to detect launches and track the flight of space apparatuses located in near earth orbits. Tracking unknown satellites is accomplished in order to assess their orbital parameters and determine their origin, purpose and type. The data obtained, in addition to solving operational missions, is used to evaluate the directions and level of development of other countries' space technology.

As the Western press indicates, the American space control system is practically global in nature in terms of the number of resources involved and their locations. It is based on the SPADATS (Space Surveillance Detection and Tracking System), which includes approximately 30 stations located on the territory of the U. S., Canada, Turkey, South Korea, Australia and on islands in the Pacific and Atlantic oceans. According to foreign press data, the equipment in these stations can observe primarily to altitudes of 3,000 (4,000) km and in some cases (with the aid of optical equipment) to the altitude of stationary orbit.

Each day 30,000-35,000 observations are made, which enables a catalogue of 4,500-4,700 space objects to be constantly forwarded to the NORAD Command Post. Separate space control squadrons man these stations. Along with TOE resources, a number of nuclear strike warning system radars and space missile center and

*Sometimes in the press it is called the space tracking system. (ed.)

U. S. scientific research organization resources, most importantly of the National Air and Space Administration (NASA), are involved in space tracking.

Air defense is one of the largest components of U. S. strategic defensive forces. Under its operational control the ADC has six air defense divisions,

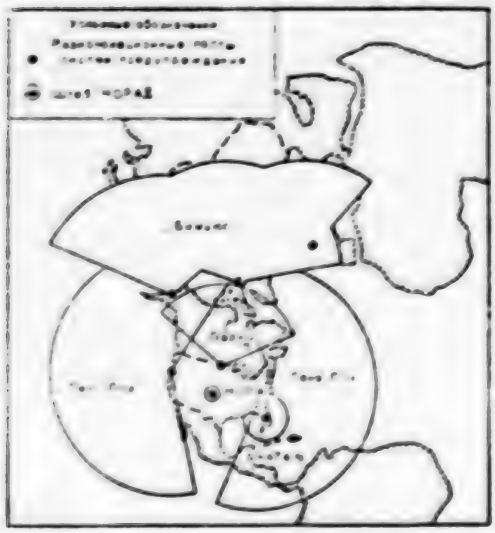

Рис. 2. Расположение и зоны действия наземных радиолокационных систем предупреждения о ракетно-ядерном ударе НОРАД

Legend:
Warning System Radar Posts
NORAD Headquarters

(Figure 2) Location and zones of operation of ADC ground based nuclear strike radar warning systems.

Рис. 3. Оперативные районы ПВО территории Североамериканского континента

Legend:
NORAD Headquarters
Air Defense Region Control Centers
(20-26 air defense regions)

(Figure 3) North American continent air defense operational regions.

two Air National Guard fighter air wings, and squadrons of distant early warning and E-3B command and control aircraft. The divisions contain regular Air Force fighter and radar squadrons and the Air National Guard Wings have fighter air groups (squadrons). Moreover, this U. S. grouping is supplemented by forces and equipment from the Canadian Air Force Fighter Air Group within the NORAD framework.

In all the North American continental air defense system includes more than 110 radar squadrons (stations), 7 E-3B aircraft, and 20 fighter air squadrons including more than 300 fighter-interceptors (F-15, F-4, F-106, F-101, CF-101) fitted with air-to-air missiles.

According to the foreign press, defense of U. S. and Canadian territory is organized according to operational regions, each of which has a numerical designation (Figure 3) by forces of the corresponding air defense divisions and Air National Guard fighter aircraft. At the start of combat operations distant early warning and E-3B command and control aircraft will be sent to them. Division command posts are simultaneously operational region control centers.

Ground based radar detection and guidance stations are deployed along the perimeter of the Continental United States and Alaska. The most heavily populated southern region of Canada is covered by the Pine Tree Line which consists of 24 stations. Long range detection of air targets and warning of strategic air attack in the northern regions of Canada and Greenland along the 70th Parallel is accomplished by 31 radar stations of the DEW (Distant Early Warning) Line. With an aerial target detection range of 400-450 km a complete radar field is created by DEW Line stations at altitudes greater than 450 m (900 m in Alaska; 3,000 m along the borders of the Continental U. S.).

Fighter aviation is based and on watch (part of its aircraft are on five minute alert) at 26 airfields in the Continental U. S. and also at airfields in Alaska, Canada and Iceland. Control of the actions of fighter-interceptors takes place from radar detection and guidance stations or directly from air defense division command posts.

Overall control of aerospace defense forces may be accomplished both from the Main NORAD Command Post (Colorado Springs) and from the Reserve Command Post at North Bay (Ontario, Canada). Both command posts are located in deep, hardened excavations and, in the opinion of American specialists, are the most nuclear protected stationary control centers of the U. S. armed forces.

In the post-war period the U. S. has spent more than $60 billion overall to create a system of aerospace defense. At the present time this system numbers up to 250 various facilities, at which approximately 49,000 personnel are stationed, including 25,700 of the ADC, 11,000 of the Canadian Air Force Fighter Air Group, and more than 10,000 of the U. S. National Guard. In the future, to reduce ADC operating expenditures it is planned to equip it with highly automated systems and equipment requiring limited logistics support.

Judging from the latest Western press reports, a new so-called Space Command was created in late 1982 in the U. S. Air Force, in accordance with Administration plans for the further militarization of space. In early 1983 the nuclear strike warning and space control systems were administratively resubordinated to this command, but the operational control structure and use of these resources within the framework of NORAD and ADC remained unchanged.

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WEST GERMAN SETAC AIRCRAFT LANDING SYSTEM

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 83 (signed to press 19 Jul 83) pp 61-62

[Article by Col Engr S. Bondarev]

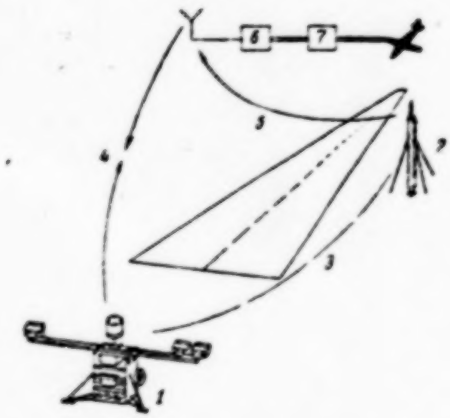
[Text] On order from the FRG Air Force command, the West German firm "Standart Elektrik Lorents" has developed a new course and glide aircraft landing system called SETAC (Sector Tacan) which, according to foreign press reports can support landings down to a ceiling of 30 m and horizontal visibility of 400 m. This system is considered to correspond to NATO requirements and was chosen by the bloc leadership as a future system. Among other things, a system apparatus for installation on Alpha Jet and Tornado aircraft has already been developed. SETAC uses in somewhat modified form the direction determination principle employed in the U.S. TACAN short-range radio navigation system, and the signal structure and operating frequencies of both systems are identical. Therefore, the on board SETAC apparatus can be used for navigation via the TACAN marker beacons as well as for landing.

The SETAC system includes both ground and on board equipment. The ground equipment includes two marker beacons, SETAC-A and SETAC-E (characteristics shown in the table). The SETAC-A is the most important and complex, since it is used both for aircraft homing to the airport from a distance of up to 57 km and as a radio range and landing beacon. Signals emitted by a central antenna which electronically scans a radiation pattern serve as the homing device. These signals enable the aircraft's on board equipment to determine the azimuth and range to the beacon. Three antennas, arranged on the ends of a pole, are used to establish the desired runway heading. One emits signals from the carrier frequency (f_o). The other two emit side frequency signals of f_o + 15 hertz and f_o + 135 hertz. As a result, a signal field interference pattern is created in the air along the runway within $\pm$ 23° azimuth, which enables the angle to be determined with a high degree of accuracy. Thus, for example, a 1° deviation by the aircraft corresponds to a 10° change in signal phase (see illustration).

SETAC-E is a glide path beacon. It also creates an interference pattern, but arranged in a vertical plane within an angle of 60°. A vertical grid of 41 emittors is set on a post of the beacon for this purpose. Since the

Characteristics of Ground Emplaced Marker Beacons

Characteristics	Marker Beacons SETAC-A	SETAC-E
Operating range (km):		
for homing	57	-
for landing guidance	35	28
Accuracy in determining aircraft position:		
for homing (degrees)	3	-
for landing guidance (degrees)	0.1-0.25	0.1-0.2
for range (meters)	20	-
Frequency operating range (megahertz)	962-1213	962-1213
Number of frequency channels	252	252
Emission power (watts)	200	120
Power consumption (watts)	320	180
Equipment weight (kilograms)	approx 600	approx 180



Функциональная схема системы СЕТАК: 1 — маяк СЕТАК-А; 2 — маяк СЕТАК-Е; 3 — сигналы синхронизации; 4 — сигналы курса; 5 — сигналы глиссады; 6 — запросчик системы ТАКАН; 7 — приставка СЕТАК

SETAC System Functional Diagram:

Key:

1. SETAC-A beacon
2. SETAC-E beacon
3. Synchronization signals
4. Heading signals
5. Glide path signals
6. TACAN system inquiry station
7. SETAC attachment

SETAC-A and SETAC-E beacons operate on the same frequencies employing time division, both beacons are synchronized in the system. Synchronization signals flow from SETAC-A to SETAC-E on a separate data transmission line.

The SETAC-A beacon (located at the end of the runway) is mobile and can be set up by a crew of two within 30 minutes. It is equipped with a battery to permit operation during short power outages.

SETAC-E is set up 100-150 m to the side of the aircraft point of touchdown. Its antenna rod is 7 meters high. It can be set up by a crew of two in 45 minutes, and is also equipped with a battery.

The on board equipment (weight 27 kg; power consumption 400 watts) is a combination of the TACAN system inquiry station with a supplemental SETAC attachment and a data set. This equipment, developed for the Tornado and Alpha Jet, is called MITAC.

The foreign press notes that test models of the SETAC ground equipment were developed in 1978, 24 on board equipment sets were manufactured by the end of 1980, and the FRG Air Force had purchased 12 sets of ground equipment by mid-1982 which will be set up at military airfields.

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